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ABSTRACT

This study of high school sophomores in 1980 and 1990 compares the experiences of students in the two cohorts, identifying changes in in-school and out-of-school activities, academic achievement, self-concept, values, plans, and aspirations. Similarities and differences between the two groups are documented using data from the National Education Longitudinal Study of 1988 (NELS:88) and High School and Beyond (HS&B, 1980). HS&B and NELS:88 sophomores are marked by basic demographic differences, including the smaller size of the NELS:88 1990 cohort, reflecting the baby bust of the 1970s, and a higher proportion of racial minority and poverty status sophomores in 1990. NELS:88 sophomores also reflect the influence of various waves of school reform since the late 1970s and early 1980s. Overall, the comparison paints a pictures that is in most respects encouraging in its portrayal of the high school academic orientation and postsecondary expectations of the 1990 sophomore class. Positive changes, however, are typically small or moderate in magnitude. Among the findings are: (1) general and college preparatory program placement has increased, at the expense of vocational program placement; (2) patterns of extracurricular participation changed especially in musical activities (31% in 1980 to 22% in 1990) and in hobby clubs (21% in 1980 to 7% in 1990); (3) changes in sophomores giving high importance to particular life values (e.g., marriage and family 83% rating this as very important in 1980, 72% in 1990); (4) small but statistically significant increase in the number of females aspiring to traditionally male-dominated non-professional occupations (15.6% in 1980 versus 18.% in 1990). Sixteen tables and 13 figures present data from the 2 studies. Three appendixes contain information about the survey sample sizes, standard errors, and other methodological and technical information. Appendix A contains an additional 20 data tables. (Contains 46 references.) (SLD)

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America's High School Sophomores: A Ten Year Comparison

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SUMMARY OF MAJOR FINDINGS:

This study of high school sophomores in 1980 and 1990 compares the experiences of students in the two cohorts, identifying changes in in-school and out-of-school activities, academic achievement, self concept and values, plans and aspirations. Similarities and differences between the two groups of sophomores are documented using data from two nationally representative studies: High School and Beyond (HS&B), and the National Education Longitudinal Study of 1988 (NELS:88). (Both HS&B and NELS:88 are part of NCES's national education longitudinal studies program, an overview of which is provided in Appendix C).

HS&B and NELS:88 sophomores are marked by basic demographic differences, including the lesser size of the NELS:88 1990 sophomore cohort (around a fifth smaller than the HS&B 1980 sophomore cohort), which reflects the "baby bust" of the 1970s, and a higher proportion of racial minority and poverty status sophomores in 1990. The NELS:88 sophomores also reflect a different experience of American education, insofar as the various initiatives of the school reform movement that rose to prominence in the late 1970s and early 1980s may have affected the nature and quality of their schooling in numerous ways. Highlights from the findings of this report are presented below. These highlights paint a picture that is in most respects encouraging in its portrayal of the high school academic orientation and postsecondary expectations of the 1990 sophomore class. The evidence for positive educational trends reported in this document does not, of course, license complacency. The positive changes reported here are typically small or moderate in magnitude, and this report provides no basis for ascertaining the mechanisms or processes by which they have occurred. Moreover, far greater improvements could be achieved, and are called for by the nation's current education goals.

SCHOOL EXPERIENCE

High school program. Student self-report data indicate that general and college preparatory program placement has increased, at the expense of vocational program placement.

- **Less than half as many 1990 sophomores (8%) identified their high school program type as vocational education as did so in HS&B ten years before (21%).**

- **Reported placement in college preparatory programs increased overall (from 33% in 1980 to 41% in 1990); significant increases were reflected in public high schools and for black and Hispanic sophomores.**

- **Comparison of HS&B and NELS:88 data suggests that for blacks (though not for Hispanics) minority-white disparities in reported academic program placement had shrunk to insignificance by 1990--27 percent of black sophomores reported themselves to be in college preparatory programs in 1980 (compared to 35 percent of white sophomores in 1980), but 41 percent in 1990, compared to 42 percent of white sophomores in 1990.**

School safety. Both in 1980 and 1990, most sophomores felt safe in school. However, between 1980 and 1990, there was a decline in the percentage of sophomores who reported feeling unsafe in school, from 12 percent in 1980 to 8 percent in 1990. While the proportion feeling unsafe has dropped among males and females, for Hispanics, blacks and whites and for sophomores in all socioeconomic status (SES) groups, disparities between groups remained high in 1990, just as they were in 1980. For example, low SES 1990 sophomores were twice as likely as high SES sophomores

to feel unsafe at school (11% vs. 5%), and public school students were twice as likely as Catholic students to feel unsafe at school (9% vs. 4%).

Motivation to learn: preparedness for class. Both in 1980 and 1990, the vast majority of sophomores reported that they usually come to school with their books, paper and pen, and homework completed. However, the number of students who often or usually come to class unprepared declined between 1980 and 1990 on all measures. For example, those who reported that they come to school without paper or pen or pencil declined by a third (from 15.1 percent of sophomores in 1980 to 10.5 percent of sophomores in 1990). Data from 1990 sophomores also evidenced statistically significant increases in the numbers of students coming to school with their homework completed and with their books.

1980-1990 TRENDS IN TESTED SOPHOMORE MATHEMATICS ACHIEVEMENT

Because common items on the HS&B and NELS:88 math tests facilitate comparisons of the tested achievement of the two sophomore cohorts, mathematics results were compared for the two groups. Between 1980 and 1990, sophomores gained significantly in their levels of mathematical achievement. These gains were present for virtually all demographic groups. However, some groups gained more than others over the decade. Specifically:

- Although white and Asian math achievement levels continue to be higher, black and Hispanic students closed some of the gap by making proportionately greater gains in mathematics achievement than their white or Asian counterparts.

- Students reporting themselves to be in the general curriculum gained significantly more than did students in the vocational program.

The following groups of sophomores showed essentially equal growth rates:

- Males and Females

- Students attending Catholic and public schools

AFTER-SCHOOL ACTIVITIES

Extracurricular activities. Patterns of reported sophomore extracurricular participation changed between 1980 and 1990. Participation in academic clubs has increased, from 26 percent of the 1980 sophomore class, to around 31 percent of the nation's 1990 sophomore class. Less involvement, however, is reported in musical activities and hobby clubs (such as photography, crafts, chess). More specifically, some 21 percent of 1980 sophomores belonged to hobby clubs, compared to only 7 percent of the 1990 cohort. Participation in musical activities declined from 31 percent of 1980 sophomores, to 22 percent of 1990 sophomores.

Reading for pleasure. Fewer than half (41%) of 1980 sophomores indicated that they read for pleasure at least once or twice a week; the same low percentage (41%) of 1990 sophomores reported reading for pleasure at least once or twice a week.

SELF CONCEPT, SOCIAL IMAGE, AND VALUES

Self-esteem. While members of both the 1980 and 1990 cohorts were likely to endorse positive items that affirmed their sense of self-esteem, 1990 sophomores were even more inclined to endorse items indicative of high self-esteem than sophomores from the earlier decade. In particular:

- **The proportion of sophomores who agreed strongly that they felt good about themselves increased from 30 percent to 35 percent;**
- **The proportion agreeing strongly that they were a person of worth showed a similar increase (from 29% to 35%);**
- **The proportion agreeing strongly that they were satisfied with themselves rose from 20 percent to 28 percent.**

Personal life goals and social values. Percentages of sophomores affirming various life values were similar across the studies. For both cohorts, most sophomores did not rate the following as "very important": correcting social inequalities, making a lot of money, living close to parents, leaving the area they live in. Somewhat under half (41% of 1980 sophomores, 43% of 1990 sophomores) did not accord having children a rating of "very important". On the other hand, large majorities affirmed the following values, in both 1980 and 1990: success in work, marriage, friendship, steady work, giving one's children better opportunities, and having leisure time. Success in work and having steady work were rated very important by 84-85 percent of each cohort.

Despite the overall similarity in the pattern of affirmations, there were a number of statistically significant shifts in the proportions of sophomores according high importance to particular life values. For example:

- **Marriage and family was rated as very important by 83 percent of sophomores in 1980 but only 72 percent of 1990 sophomores--behind work and friendship in importance**
- **Making money was rated as very important by 35 percent of 1980 sophomores but by 44 percent of 1990 sophomores;**
- **Having leisure time was rated as very important by 70 percent of 1980 sophomores but by somewhat fewer (65 percent) 1990 sophomores; and**
- **Correcting inequalities was rated as very important only by 14 percent of 1980 sophomores, but 19 percent of 1990 sophomores felt that correcting social inequalities was very important.**

PLANS AND EXPECTATIONS

Occupational expectations. A possibly important trend to note in the occupational expectations of the nation's sophomores between 1980 and 1990 is the small but statistically significant increase in the number of females aspiring to traditionally male-dominated non-professional occupations (15.6% of 1980 sophomores versus 18.2% in 1990).

Educational expectations: how much education student expects to get. **1990 sophomores are significantly more likely to say they will go on to complete a bachelor's or advanced degree. For college graduation, the proportion increases from 23 percent in 1980 to 32 percent in 1990; for a postgraduate degree, the proportion increases from 18 percent in 1980 to 27 percent in 1990. These higher educational expectations hold across all SES groups and for Hispanics, blacks and whites; Asian educational expectations remain at the very high levels that were already reflected in the 1980 data. In addition, members of the 1990 cohort are more likely to say they will attend a postsecondary institution right after high school, with no delays, with 60 percent of 1990 sophomores planning immediate entry, as contrasted to 49 percent of their counterparts from a decade before.**

Press toward postsecondary education. **1990 sophomores reported receiving significantly more adult advice urging them to attend college after high school than did 1980 sophomores. Fathers, mothers, guidance counselors and teachers in 1990 were all consistently more likely to recommend college attendance:**

- **77 percent of 1990 sophomores reported that their fathers recommended they go to college; 59 percent of 1980 sophomores reported this recommendation;**
- **83 percent of 1990 sophomores indicated that their mothers recommended they go to college; the comparable figure in 1980 was 65 percent;**
- **65 percent of 1990 sophomores reported that their guidance counselor urged them to attend college after high school, as contrasted to 32 percent for 1980 sophomores; and**
- **66 percent of 1990 sophomores reported that their teachers recommended attending college, compared to 32 percent for 1980 sophomores**

Foreword

This report describes patterns of continuity and change between the spring 1990 sophomores studied in the National Education Longitudinal Study of 1988 (NELS:88) and sophomores studied a decade earlier. As such, it illustrates and fulfills a major purpose of the NCES national education longitudinal studies, which is to provide comparative data at different points in time that are germane to educational policy and that permit examination of trends relevant to educational and career development and societal roles.

High School and Beyond (HS&B) began with two cohorts, 1980 sophomores and 1980 seniors.[1] As in the National Longitudinal Study of the High School Class of 1972 (NLS-72) before it and NELS:88 eight years later, the HS&B baseline study employed a two-stage probability sample to select nationally representative students and schools. HS&B data have been widely used, and the database has grown as sample members have been resurveyed over time. Indeed, the HS&B sophomores were surveyed for a fifth time in the spring of 1992. Much as the HS&B data about the processes and outcomes that are central to an understanding of secondary education in this country have informed policymakers and researchers, NELS:88 data are expected to provide similarly rich information about factors that influence student academic performance and social development and the processes through which these factors operate.

Under the sponsorship of the National Center for Education Statistics (NCES), and with support from the National Science Foundation (NSF), the Office of Bilingual Education and Minority Languages Affairs (OBEMLA) and other agencies, the National Education Longitudinal Study of 1988 (NELS:88) is being conducted in several waves. The first wave (the 1988 base year) recorded the experiences of a representative sample of eighth graders within a nationally representative sample of their schools; the second wave (the 1990 first follow-up) traced them to tenth grade; the third wave (the 1992 second follow-up) followed them to twelfth grade; and the fourth wave (the 1994 third follow-up) will follow them out of high school. The longitudinal design of NELS:88 permits researchers to observe the critical transitions of students to and from high school, while surveys of parents, teachers, and principals provide contextual data that help identify student, school, and parental experiences that promote learning.

It is our hope that this report will be of interest to policymakers and educational practitioners, as well as to education researchers. Policymakers can use HS&B and NELS:88 results to turn statistics into practical, workable programs to help solve the problems facing the American educational system and its students. Researchers may be inspired by this report to use HS&B and NELS:88 data to explore their own interests and concerns, and to thereby further illuminate the condition and prospects of American secondary education.

Paul Planchon, Associate Commissioner of Education Statistics
Jeffrey Owings, Chief, Longitudinal and Household Studies Branch

[1]Further information about the history, design, and research program of NLS-72, HS&B and NELS:88 is provided in the overview contained in Appendix C of this report.

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We would like to thank the many individuals (as well as organizations and institutions) who have contributed importantly to the success of the National Education Longitudinal Study of 1988 (NELS:88) first follow-up.

The NELS:88 Technical Review Panel advised the National Center for Education Statistics' contractor for NELS:88--the National Opinion Research Center (NORC) at the University of Chicago--on design and questionnaire development issues. Members of the panel were: **Jerald G. Bachman**, Program Director and Research Scientist, Institute for Social Research, University of Michigan; **Gordon Ensign**, Supervisor, Testing and Evaluation, State of Washington; **Lyle V. Jones**, Director, L.L. Thurstone Psychometric Laboratory, University of North Carolina; **Nancy L. Karweit**, Principal Research Scientist, Center for Social Organization of Schools, Johns Hopkins University; **Patricia Shell**, formerly the Superintendent of the Brazosport Independent School District, Freeport, Texas; **Marshall Smith**, Dean, College of Education, Stanford University; **Richard J. Murnane**, Associate Professor of Education, Harvard University; and **John Stiglmeier**, formerly the Director, Information Center on Education, New York State Department of Education.

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The HS&B-NELS:88 1980-1990 sophomore trend report was prepared by NORC and ETS staff under the supervision of NCES. The authors are **Kenneth A. Rasinski** and **Steven J. Ingels** of NORC, and **Donald A. Rock** and **Judith M. Pollack** of ETS. NORC authors prepared chapters 1-2 and 4-7; ETS authors prepared chapter 3. **Amelia Solorio** and **Cassandra Britton** of NORC formatted the document and helped prepare final copy.

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NOTE: **Appendix A** provides standard errors of measurement for the estimates presented in all tables in the text of this report. Table numbers and labels for Appendix A recapitulate the scheme above except that each table is preceded by the prefix "A". (For example, standard errors for text table 2.1 will be found in appendix table A2.1.) Preceding the standard errors tables is a table of total and analytic subgroup sample sizes (unweighted Ns), designated as Table A1.

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ORGANIZATION AND BASIC APPROACH OF THIS REPORT

This report presents information on similarities and differences between American sophomores in 1980, as studied in High School and Beyond (HS&B), and sophomores in 1990, as studied in the National Education Longitudinal Study of 1988 (NELS:88). The comparisons between these two cohorts are presented in six chapters and summarized in an additional chapter.

To provide a context for comparison, **Chapter 1** describes changing practices and policies of the American educational system, and sociodemographic changes that took place in American society in the 1980s. **Chapter 2** compares the high school experiences of HS&B and NELS:88 sophomores, and in particular, differences in high school program participation.

Chapter 3 contrasts the mathematics achievement of 1980 and 1990 sophomores. NELS:88 mathematics test scores have been re-scaled to permit cross-cohort comparisons for major population subgroups at the two time points. **Chapter 4** investigates out-of-school experiences, such as participation in the high school's extracurriculum, and leisure time activities.

Chapter 5 explores the self-perceptions, social image and values of 1980 and 1990 sophomores, while **Chapter 6**, examines education and career aspirations. **Chapter 7** summarizes major conclusions.

Appendices provide technical notes, full references for text citations, and tables of standard errors of measurement and sample sizes for all reported population estimates, as well as an overview of HS&B and NELS:88. More specifically:

The **References** section supplies a bibliography of sources cited in this report. **Appendix A** supplies tables of standard errors, sample sizes, and, for Chapter 3, effect sizes, and other technical data.

Appendix B comprises methodological and technical notes on HS&B and NELS:88 sample design, precision of estimates, statistical procedures, analysis procedures, and variables employed in analyses.

Appendix C provides an outline of the HS&B and NELS:88 research design and a brief history of the two studies and their place in the National Center for Education Statistics national education longitudinal studies program.

All comparisons cited in the text of the report have been tested for statistical significance using Bonferroni adjustments and are significant at the .05 level. (See Appendix B for a discussion of procedures used).

Variables for this report were selected using the following procedure. First, the NELS:88 First Follow-Up and HS&B Base Year questionnaires were examined for comparable items.[1] Second, items that were unequivocally known to be defective measures were eliminated.[2] Next, in order to keep this report to a reasonable length and concentrate its focus, the items were divided into those that were related

[1]A list of 81 items comparable across the two surveys appears in Appendix F of the NELS:88 First Follow-Up Student Component Data File User's Manual (Ingels et al., 1992, NCES 92-030).

[2]For example, although the HS&B siblings question could have been collapsed to produce a variable roughly equivalent to the NELS:88 number of older and younger siblings item, this possibility was rejected because nonresponse was excessively high on the HS&B item (the constituent data elements had nonresponse rates of 23-44%).

to the mainstream high school experience, and those that were not. At this stage, items relating to remedial education, special education, bilingualism, English language skills of bilinguals, religiosity, family composition, and childbearing out of wedlock were eliminated. The remainder of the available comparable items were included in the report with one exception. The wording of the stem and the wording and order of response scales of the item assessing whether students thought they would graduate from high school were judged to be insufficiently comparable.[3]

Because the number of items that are comparable is so limited, both HS&B and NELS:88 support much richer within-study analyses than cross-cohort comparisons with each other. Many of the questions asked in NELS:88 reflect issues and concerns that have come to the forefront just in the last ten years. Other analysis reports are in preparation that make far greater use of the wealth of information gathered in the NELS:88 first follow-up, particularly the many non-HS&B items that were developed for the study. Forthcoming NCES publications depict the changes experienced by the eighth grade cohort between 1988 and 1990, and also provide a comprehensive statistical profile of the American high school sophomore in 1990.

[3] The NELS:88 item asked "Do you expect to graduate from high school?" and offered "Yes", "Probably", "Probably not" and "No" as response options; HS&B asked "How sure are you that you will graduate from high school?" and offered "Very sure I'll won't graduate" "I probably won't graduate", "I'll probably graduate", and "Very sure I'll graduate".

CHAPTER 1: THE CHANGING CONTEXT: AMERICAN EDUCATION & SOCIETY, 1980-1990

This trend report addresses the following fundamental question: **How did American sophomores change between 1980 and 1990?** Implicit in this question is also the issue of continuity: **In what ways are American sophomores of 1990 like those of the earlier decade--in what ways have they not changed?** This broad question may be posed within a number of domains. Specifically, we may ask--how do the school experiences, tested achievement, out of school experiences, self concept and values, and aspirations of America's 1980 and 1990 sophomores differ? This broad question can also be re-asked in more specific terms--in areas where changes have occurred, do we see differences by subgroups of students, that is, did such changes vary for students of different race or ethnicity, sex, socioeconomic status, achievement level, school type or region?

Before inquiring whether, and how, sophomores might have changed over the past decade, it is desirable to ask in what ways schools and American society might have changed over the same period. Although the focus of this report is to describe differences, not to isolate their causes, a preliminary glimpse at changes in American education and society may provide a context for understanding some of the many possible reasons why today's sophomores may be different.

Changes in American Society: Demographic and Socioeconomic Forces

Significant sociodemographic changes occurred in America in the 1980s. Six general trends are particularly worthy of note:

1. The "baby bust" or decline in birthrates of the 1970s that led to declining school enrollments in the 1980s;

2. Geographic shifts in population, from the east and midwest to the west and south;

3. Changes in family composition and structure, such as declining numbers of two-parent families, and increased labor force participation of mothers;

4. Increased racial, cultural, linguistic and economic diversity in the school-age population.

5. Increasing numbers of children in poverty;

6. Structural changes in the American economy.

Declining birthrates. Birthrates overall were low in the 1970s. In 1964, when most members of the HS&B sophomore cohort were born, the birth rate per 1000 U.S. women 15-44 years old was 104.8. In 1974, when most members of the NELS:88 sophomore cohort were born, the birthrate per 1000 U.S. women age 15-44 had dropped to 68.4 (Statistical Abstract of the United States; 1966, 1976). Birthrates declined for both whites and nonwhites, as illustrated below:

	1964	1974
Birthrate per 1000 white females 15-44	99.8	64.7
Birthrate per 1000 nonwhite females 15-44	141.5	91.0

Though somewhat offset by increased immigration, these low birthrates led to declining secondary school enrollments between 1980 and 1990. Thus, in sheer numbers, the 1990 sophomore cohort is substantially smaller than the 1980 sophomore cohort. Current Population Survey[4] data show the number of high school students declining from 15.2 million in fall of 1979 to 12.9 million in fall of 1989 (CPS reports P-20 No. 360 and No. 452) while NCES Common Core of Data public school sophomore enrollment tallies show (Digest of Education Statistics 1991, Table 38) a decline from autumn 1979's 3.5 million to 2.9 million public school sophomores by fall of 1989--a decline of nearly a fifth.

Geographic shifts in population. Additionally, there have been regional shifts in America's population, with California, Florida and Texas accounting for about half the nation's population growth over the decade. The number of school-age children between the ages of five and seventeen has dropped markedly in both the Northeast (a 15% decline) and Midwest (an 11% decline), while the West experienced an increase (9%).[5] The population of school-age children in southern states remained stable during this period.

Changes in family composition and structure, and the locus of child care. With declining birthrates, families grew smaller. Nevertheless, decennial census statistics show that for children under 18, the poverty rate increased over the decade from 16 percent to 18 percent. Also the percentage of female-headed households with children rose from around 17 percent to 20 percent, partly reflecting an increase in the proportion of children born to unmarried mothers. One-parent female-headed households increased from 10.8 percent in 1970, to 13.9 percent in 1980, to 16.5 percent in 1990 (U.S. Census, General Social and Economic Characteristics). There are racial differences in the proportion of families maintained by women--for example, 1989 figures show that 44 percent of black family households, 23 percent of Hispanic, and 13 percent of white family households were maintained by women (CPS report Series P-20 No. 441). Two-parent families constituted 86 percent of all families with children under 18 in 1970, 82.8 percent of all such families in 1980, and 79.1 percent of families in 1990. Female labor force participation and social autonomy also continued to increase, with more mothers in the work force, and in the 1970s the proportion of children attending prekindergarten education began a steep rise (The Condition of Education: 1991, v.1, 1:1).

Racial and ethnic change. Minority populations grew as a proportion of total population in the 1980s, leading to greater linguistic and cultural heterogeneity in the schools. Asians and Hispanics have become a greater proportion of the population. Although the Asian proportion of the American population is comparatively small, owing to continued large-scale immigration, Asians (particularly school-aged Asians) are proportionately the fastest-growing minority, with Hispanics also rapidly increasing as a proportion of total population. Generalizing from 1990 Bureau of the Census data, De La

[4]Although the HS&B and NELS:88 datasets are sensitive to very large demographic changes, the questionnaires do not elicit data on all subjects of demographic interest, nor were the sample sizes designed to provide highly precise estimates of the full range of sociodemographic changes outside of schools. Thus numbers of individuals in the HS&B sample for comparatively rare policy-relevant subgroups are not sufficiently large to detect moderate changes in numbers with high statistical reliability. (For example, there are only 405 Pacific Basin Asians in the HS&B sophomore cohort, too small a number to support precise population trend estimates.) Nevertheless, such groups may contribute importantly to major long-term demographic trends. Because of limitations on questions asked and the imprecision of some estimates, we draw on other sources, such as data gathered by the Bureau of the Census, to obtain more refined measures with which to profile some of the changes in American society that occurred between 1980 and 1990.

[5]U.S. Department of Commerce, Bureau of the Census, State Populations and Household Estimates: July 1, 1989. Current Population Reports, Population Estimates and Projects. Series P-25, No. 1058. March 1990

Rosa and Maw (1990) note that "since 1980, the Hispanic population has grown approximately five times as fast as the non-Hispanic population and is the youngest major U.S. group..."

Data gathered by the U.S. Department of Education's Office for Civil Rights show that minority enrollment as a proportion of total enrollment in public schools rose from 24 percent in 1976 to around 30 percent in 1986 (The Condition of Education: 1991, v. 1, Chart 1:18). In the same period:

- Hispanic enrollment increased from 6.4 percent to around 10 percent of the total, as the number of Hispanic public school students increased by about 45 percent;
- The white proportion of public school enrollment declined from 76 percent to 70 percent;
- Enrollment of Asian students increased 116 percent (from 535,000 in 1976 to 1,158,000 in 1986) as the Asian proportion of total public school enrollment rose from 1.2 percent to 2.8 percent.

Children in poverty. As the decade progressed, the proportion of school children from poor families grew. In 1980, some 12.4 percent of children under the age of sixteen lived in poverty. In 1990, the percentage of children below the poverty level had grown to 20.1 percent (1980 U.S. Census of Population: Detailed Population Characteristics, Table 304; 1991 Statistical Abstract of the United States, Table 748).

Structural changes in the American economy. Jobs in manufacturing declined over the decade, although there was growth in comparatively lower paying service jobs. Despite growth in service industries, the market for unskilled and semi-skilled workers shrunk in the 1980s; American workers with limited skills were increasingly in competition with low wage workers in poorer countries. The 1980s were characterized by a growing gap in the economic rate of return of high school diplomas and college degrees. Over the decade, wages earned by college graduates rose by 11 percent, while wages of high school graduates declined between 20 and 28 percent, by various estimates.[6]

Given these national trends, it will be instructive to compare the situation of 1980 and 1990 sophomores along a number of dimensions. The cohorts can be compared in terms of racial composition (Table 1.1); racial composition by socioeconomic status quartile (Table 1.2); racial composition by school sector (Table 1.3); and finally, by the respective cohorts' enrollment in the various school sectors, by socioeconomic status (Table 1.4).

Racial composition. The racial composition of the 1980 and 1990 sophomore cohorts is depicted in Table 1.1 below. While 1980-90 subgroup differences are not significant, given small sample numbers for subgroups, Bureau of the Census data[7] confirm the key trend--an increase in the percentage of students who are members of racial minority groups. The 1990 percent minority grew by 12.5 percent

[6] Harvard Education Letter, IX(1) January 1993.

[7] Issues such as the extent to which HS&B and NELS:88 estimates may correspond to or differ from other sources, reasons for divergence of estimates, and the comparability of HS&B and NELS:88 estimates, are addressed in the methodological and technical appendix, Appendix B.

beyond the 1980 base, and 3 percentage points against the total population (from 24.7 to 27.7 percent). NELS:88 Asians and Hispanics show increases from their HS&B proportions, as portrayed in Table 1.1.

Table 1.1. Percentages of 1980 and 1990 sophomores in each racial/ethnic category

Race/Ethnicity	1980	1990
All Sophomores	100.0	100.0
Asian	1.3	3.9
Hispanic	8.3	10.1
Black	14.2	12.5
White	75.3	72.3
American Indian	1.0	1.2

Note: Percentages may not sum to 100 because of rounding.

Sources: High School and Beyond base year sophomore cohort and NELS:88 first follow-up, U.S. Department of Education, National Center for Education Statistics.

Racial composition across socioeconomic status levels. For both HS&B and NELS:88, a socioeconomic status (SES) quartile variable was built using information about parental education level, parental occupation, family income, and household items (see appendix B for details on construction). Students were placed in quartiles, based on their standardized composite score. For purposes of this analysis, the middle two quartiles were collapsed, creating a three-level SES scale with the values "high" (highest quartile), "middle" the (two middle quartiles), and low (the lowest quartile).[8]

A comparison of the distribution of racial/ethnic groups across levels of socioeconomic status is shown in Table 1.2. The results in Table 1.2 suggest a remarkable stability. Though there are percentage shifts in the table, none of the changes across cohort are significant.

[8]Use of SES quartiles provides a relative measure of the socioeconomic status of families, and is not keyed to an objective threshold of well-being. Thus one quarter of each cohort will, by definition, reside in the bottom SES quartile, even if education levels, income, the number of persons in higher prestige occupations all increase. The fact that the child poverty rate increased by 8 percent over the decade will not be registered in an SES measure derived from a child-based sample, though the measure can certainly detect changes in sociodemographic subgroups' relative status (for example, a higher proportion of blacks might move into the highest SES quartile, while the proportion of high SES whites might decrease), trends over time in access of different SES groups to public, Catholic and other private schools, and so on.

Table 1.2. Percentages of 1980 and 1990 sophomores in each socioeconomic category, by race/ethnicity

Race/Ethnicity	Low SES		Middle SES		High SES	
	1980	1990	1980	1990	1980	1990
All Sophomores	25.0	25.1	50.0	50.4	25.0	24.6
Asian	23.2	18.3	45.4	49.8	31.5	32.0
Hispanic	48.2	51.6	40.8	37.7	11.1	10.7
Black	45.7	42.2	43.5	48.5	10.9	9.4
White	18.8	18.7	52.2	52.4	29.0	28.9
American Indian	38.0	41.4	50.9	52.2	11.1	6.3

Note: Owing to rounding, percentages may not sum to 100.

Sources: High School and Beyond base year sophomore cohort and NELS:88 first follow-up, U.S. Department of Education, National Center for Education Statistics.

Race by school sector. Table 1.3 shows the overall proportion of students attending schools in the public, Catholic, and non-Catholic private sectors.[9] The data indicate that these proportions have remained stable over the decade. In addition, there has been no appreciable sector shift within ethnic or racial group.

SES by school sector. The data in Table 1.4 indicate no significant change in sector by socioeconomic status.

Changes in America's Schools: The School Reform Movement

These sociodemographic trends are important to note. Equally, it is important to take note of trends within America's educational system, including some that may interact with these demographic tendencies in various ways. For example, because the percentage of students from poor homes has increased, it is necessary to take note of any increase in educational programs designed to compensate for the possible disadvantages of students from poverty backgrounds.

[9]For purposes of this report, the three broadest school type categories were utilized from the many available in the HS&B and NELS:88 datasets--public, Catholic, and all other private. These broad categories mask many interesting differences between the further subdivisions of both private and public schools. There is, of course, enormous diversity in the kinds of schools in the Other Private category, which may be religious or secular, and which range from elite independent schools that draw their student body nationally to yeshivas and small Christian academies. There also are differences between Catholic schools, some of which are captured by NELS:88 (for example, differing sources of control, such as diocese, parish, or a religious order) or HS&B (for example, difference in racial composition--Catholic schools with high percentages of minority students were included in HS&B at a disproportionate rate). There is considerable diversity in public schools, which could be subdivided into comprehensive schools, magnet schools, alternative schools, schools of choice, and so on. Because of the somewhat different sampling schemes in HS&B and NELS:88, the three broad school type categories of public, Catholic, and other private provide the best basis for drawing meaningful comparisons between the two studies. For analyses within either study, many more options are viable.

Table 1.3. Percentages of 1980 and 1990 sophomores in each sector, by race/ethnicity

Race/Ethnicity	Public		Catholic		Other Private	
	1980	1990	1980	1990	1980	1990
All Sophomores	90.6	90.3	6.1	6.1	3.3	3.6
Asian	91.1	84.6	5.9	8.1	2.9	7.3
Hispanic	92.3	92.8	5.8	5.5	1.9	1.7
Black	97.0	93.8	2.5	5.3	0.5	0.1
White	89.2	89.5	6.9	6.2	4.0	4.2
American Indian	97.1	98.3	1.1	1.7	1.8	0.0

Note: Owing to rounding, percentages may not sum to 100.

Sources: High School and Beyond base year sophomore cohort and NELS:88 first follow-up, U.S. Department of Education, National Center for Education Statistics.

Table 1.4. Percentages of 1980 and 1990 sophomores in each sector, by socioeconomic status

Socioeconomic status	Public		Catholic		Other Private	
	1980	1990	1980	1990	1980	1990
All Sophomores	90.6	90.3	6.1	6.1	3.3	3.6
Low SES	96.6	97.2	2.5	2.3	0.8	0.5
Middle SES	91.6	91.1	5.8	6.4	2.6	2.5
High SES	81.8	80.8	10.6	9.8	7.5	9.4

Note: Owing to rounding, percentages may not sum to 100.

Sources: High School and Beyond base year sophomore cohort and NELS:88 first follow-up, U.S. Department of Education, National Center for Education Statistics.

While the racial composition of the population will reflect various factors, the racial composition of individual schools and classrooms is manipulable (for example, the racial composition of a neighborhood school can be altered by busing in students from another area, or students and parents can be offered wide choices for attendance, beyond the neighborhood school). Indeed, the HS&B sophomores and seniors of 1980 represent the first generation of American students whose elementary and secondary school careers reflect the effects of court-ordered desegregation--a judicial policy that drew its social science rationale in large measure from the 1966 Congressionally-mandated NCES report, Equality of Educational Opportunity (Coleman et al., 1966). For the NELS:88 sophomores, throughout the decade of the 1980s, magnet school programs have been used[10] both to provide parents and students with greater choice, and to promote racially integrated learning environments.

[10]Just how successful use of magnet schools has been as a desegregation strategy is an important question that has not been conclusively answered at this time.

Just as the HS&B cohorts were affected by changes in the nation's educational system in the late 1960s and the 1970s--most notably, compensatory programs to assist the disadvantaged such as Head Start (a program that provides comprehensive developmental services for low-income preschool children) and Chapter I funding for elementary and secondary compensatory education; Pell Grants and other provisions for postsecondary aid; and declining pupil-teacher ratios (Fetters, Brown, & Owings, 1984)--so too have NELS:88 sophomores been affected by further changes in the manner and matter of schooling in the United States.

Despite the numerous 1970s programs designed to spur overall achievement and, in particular, to foster equity in achievement through compensatory measures, many of the educational results reported for the HS&B cohorts form an ominous backdrop for examining the changed educational environment of NELS:88 sophomores. The HS&B senior cohort showed lower test performance and time spent on homework than had NLS-72 seniors, and the percentage of students taking an academic curriculum declined (Fetters, Brown & Owings, 1984). HS&B's 1980 sophomores, when tested as seniors in 1982, also showed a decline in tested achievement compared to 1972 seniors. Ekstrom, Goertz and Rock (1988) reported test declines for almost all subgroups, though score declines were greatest for mid and low SES and for public school students.

This decline was registered in the results of other national studies and testing programs as well. SAT scores continued a decline that had started in the 1960s but that became most serious in the 1970s; meanwhile, American students performed poorly compared to students in other countries on the Second International Mathematics and Science studies (Ekstrom, Goertz & Rock, 1988). Data from the National Assessment of Educational Progress show general decline in most subjects at most grade levels throughout the 1970s, often with improvements to earlier levels--but not beyond--by the mid-1980s (Mullis, Owen & Phillips, 1990). By the time that the National Commission on Excellence in Education had issued its 1983 report, A Nation At Risk: The Imperative For Educational Reform, the call for fundamental change to arrest and reverse the declining levels of academic achievement in the United States had begun to be heard. During the decade preceding the entry of the NELS:88 cohort into tenth grade, countless state and local initiatives attempted to reformulate educational objectives, revamp education's basic infrastructure, evaluate teacher training, and reallocate scarce resources to bring about systemic improvements. The reforms of the 1980s have changed (if not always transformed) many of the schools in which NELS:88 sophomores have been educated. To better understand differences between 1980 and 1990 sophomores, then, we would do well to consider major reform initiatives and their impact on schooling.

During the period of time that NELS:88 students advanced through the grades to their sophomore year, many currents, particularly efforts for improvement and change, were operative in the school environment. Among the more notable currents of reform are the following:

- Changes in school organization and management;
- Efforts toward greater professionalization of teachers;
- Modifications of curriculum requirements and content;
- Reform of instructional practices;
- Calls for increased parental participation in school affairs;

- Growth of alternative programs for students at risk of educational failure and of cooperative learning as an alternative to tracking;
- Increased prominence of drug and alcohol prevention programs;
- Programs regarding sexual risk behaviors;
- Increasing availability of computerized learning technologies in schools.

Other reform initiatives that were widely instituted only in the late 1980s--for example, greater emphasis on higher order thinking skills and problem-solving; greater school choice, both intra- and inter-district; and increased emphasis on setting national education goals--may have been in effect too short a time to have substantially affected this cohort.

Such reforms are not all of a piece--either conceptually (for there are tensions between the claims of equity and excellence, and between competing strategies for school betterment)--or temporally (reform evolved over the decade, changing in emphasis from placing first importance on raising standards for students and personnel and schools to finding means for restructuring programs and schools). Murphy (1990) describes the 1980s reform movements in terms of three distinct waves of objectives and initiatives. From 1982-85, efforts to improve schooling focused on components such as teacher preparation and training, curriculum change, and testing to ensure greater accountability in the meeting of measurable standards. The second wave of school reform, Murphy maintains, flourished from 1986 to 1989, and, more radically, advocated empowering parents and educators through decentralized school management. A third wave of reform, beginning in 1988, is child-centered, and seeks to empower the student. A further recent current in the reform movement urges a more systemic approach to the transformation of learning goals, instructional methods, and school governance, to replace the largely piecemeal and uncoordinated initiatives of the 1980s. As Cuban (1990) reminds us, reform is a recurring motif in American education, but may emphasize either teacher-centered subject-based instruction or more child-centered traditions of active discovery.

Proposals for reform do not, of course, automatically translate into initiatives that have affected the lives of NELS:88 sample members. America's school system is highly decentralized, and there have been many very different experiments in reform in different locales. Moreover, all attempts at reform must face the fact that organizational features of schools are more open to manipulation than what happens in the classroom. Thus, there is some evidence that instructional practices have generally shown little change (Mullis, Owen & Phillips, 1990). On the other hand, academic requirements have, in the main, been stiffened, and teacher testing has become widespread. Since the 1983 publication of **A Nation at Risk**, 42 of the fifty states have raised their high school graduation requirements, and 47 states have mandated student testing standards (Coley & Goertz, 1990; Medrich, Brown & Henke, 1992).[11] And

[11]It is difficult to assess the impact of more stringent state standards, however, because it is difficult to know the proportion of cases in which increased state requirements exceed existing local requirements. Comparing the 1992 NELS:88 transcripts results with the 1982 HS&B transcripts results will permit more precise measurement of the extent to which students are completing more academic coursework, whether motivated by local, state, parental or personal goals or requirements.

despite stiffened graduation requirements, the available evidence suggests that during the 1980s, dropout rates did not increase, but on the contrary, substantially declined.[12]

To some modest extent, this report can provide data that may help to answer the fundamental question that school reform poses--to wit, in the aftermath of reform efforts, are American students in general being better educated, better prepared for employment and postsecondary schooling, and better prepared to take on adult roles than they were in 1980 when HS&B sophomores were surveyed? The various comparisons and findings of this report on trends concerning program choice, use of leisure time and postsecondary aspirations and values, should be understood within the wider context of recent changes--and the aspiration for yet greater changes--in American education.

[12]Between 1980 and 1991, the status dropout rate (that is, the proportion of the population who, at a given time, had not completed high school and were not enrolled in school, regardless of when they dropped out) declined 11 percent, i.e., from 14.1 percent to 12.5 percent. The event dropout rate (that is, the proportion of students dropping out in a single year) declined 34 percent--from 6.1 percent in 1980 to 4.0 percent in 1991 (McMillen, Kaufman, Hausken & Bradby, 1992, p.50). There are many factors that must be counted in the social and educational context in which these declining dropout rates occurred. For example, the fact that real wages for those with high school and less than high school education dropped during the 1980s could have provided an impetus for many students to remain in school longer, or dropout prevention programs may have contributed to this result--this report provides no basis for attributing causes or weighing the influence of possible contributing factors.

CHAPTER 2: SCHOOL EXPERIENCES

High school provides a wide range of experiences and opportunities to young people. Three aspects of school experience will be examined in this chapter:

1. High school program
2. Motivation to learn
3. School safety

A related area--achievement in school--will be examined in a separate chapter (chapter 3), which compares the test performance in mathematics of the two sophomore cohorts.

One of the most important determinants of a sophomore's academic experience is his or her **high school program**. Whether students are in an academic, general, or vocational program may strongly define the course content they are exposed to and the kinds of classroom experiences they will have.

A student's high school experience is affected not only by external factors. Internal factors, such as the student's **motivation** and initiative to learn, also help determine the kind of educational experience the student will have. HS&B and NELS:88 have in common several items that measure tenth graders' academic motivation, and that allow us to compare HS&B and NELS:88 sophomores' willingness to meet the most basic requirements of learning, such as coming to school with books, paper and pencil, and completed homework

In addition, **school safety**--whether one feels physically safe, or threatened by violence in school--is surely a critical aspect of the high school experience.

High school program. Placement in academic programs declined over the course of the 1970s, as is demonstrated by comparisons of NLS-72 and HS&B seniors (Fetters, Brown & Owings, 1984). Was any of this ground regained--that is, did a larger proportion of students opt for academic programs--in the aftermath of 1980s reform initiatives? This question may be answered by comparing HS&B and NELS:88 sophomores.

One of the most consistent influences on high school students is the program in which they are placed or enroll. Moreover, program placement[1] strongly influences later occupational opportunities and prospects for entry into and success in postsecondary education. The differentiation of the high school curriculum into academic, general, and vocational programs is intended to meet the diverse needs of different groups of students. For example, the academic track is designed to prepare the college bound for higher education, while vocational courses are designed to enhance the marketable occupational skills of those going directly from high school into the labor market.

However, differentiation of the high school curriculum into distinct program types has had its critics (on both efficiency and equity grounds) as well as proponents. For example, the effectiveness of

[1] Although programs may be chosen as well as assigned, the term program placement is used here in distinction to program participation or enrollment. Students in a general or academic program may enroll in one or more sequences of courses in vocational education, and indeed Hoachlander, Kaufman & Levesque (1992) point out that "In the high school senior class of 1987, 98 percent of all public high school graduates completed at least one course in vocational education during their high school careers... For most students this one course was not simply a typing course; in fact, almost 90 percent of all graduates completed at least one course in specific labor market preparation."

vocational programs historically in increasing students' employment opportunities has sometimes been questioned (Grubb & Lazerson, 1982), while others have maintained that, as with ability grouping, "the division of secondary schooling into vocational and academic programs throughout the twentieth century has reinforced the social, racial and economic stratification of American society" (Oakes, 1985, p.153).[2]

Increasingly, however, technologically advanced jobs in the marketplace require high levels of both academic and vocational skills, and the need to integrate academic and vocational curricula has increasingly been felt. Hence the 1990 Amendments to the Carl Perkins Act require programs receiving federal vocational education funds to "integrate academic and vocational education in such programs through coherent sequences of courses so that students achieve both academic and occupational competencies" (Section 235). Given the recency of vocational reform efforts, it is the conditions such initiatives have been designed to address--such as the need for better articulation of the school-to-work transition, and the need to impart technological skills without shortchanging academic goals--and not reforms themselves, that are most likely to have had a major impact on NELS:88 sophomores.

In examining program differences between 1980 and 1990 sophomores, two past trends should be noted. First, across program types, the proportion of students in each kind of program has varied over time. Second, within vocational programs, traditionally, some forms of occupational preparation have been male-dominated, others female-dominated; over time, changes have been observed in this pattern. It may be useful to expand on each of these two points.

In terms of college preparatory programs, the school reform agenda of the 1980s reacted against the dominant program placement trends of the 1970s. In the 1970s, placement in the academic curriculum declined, with concomitant increases in general program and (for males) vocational program placement (Fetters, Brown, & Owings 1984). The school reform movement of the 1980s placed renewed emphasis on the academic curriculum, and, more recently, on revitalization of the vocational education curriculum. The general curriculum has evoked little enthusiasm among reformers, in that it arguably is not well suited to facilitating either academic or employment transitions after high school.

While sorting of students between academic, general and vocational programs has traditionally reflected socioeconomic stratification, an additional kind of sorting within vocational programs is associated with gender. For example, enrollees in agricultural and industrial studies have been disproportionately male, while health and business or office courses, and home economics, have had greater female enrollment. Gender differences in placement across different types of vocational emphases diminished substantially during the 1970s (Fetters, Brown, & Owings 1984; Hoachlander, Kaufman & Levesque 1992).

These trends suggest two ways in which HS&B and NELS:88 sophomores may meaningfully be compared. First, given criticisms of vocational programs for their low rate of economic return to participants, and given criticisms of the general and vocational tracks as being less rigorous in imparting the most socially valued forms of knowledge, have program placement patterns across the various program types changed in recent years? In particular, has the 1980s "back to basics" emphasis on

[2]It is not clear that at present minorities are more likely to take concentrated coursework in vocational education. Data from the 1987 High School Transcripts Study show that white students were more likely to earn 8.00 or more Carnegie units (one unit = completion of a course that meets 1 period per day for 1 year) in vocational education than were black or Hispanic students (Hoachlander, Kaufman, and Levesque, 1992). However, racial stratification may occur more in the kinds of vocational courses students take than in enrollment in vocational courses per se, with blacks and Hispanics less likely to be enrolled in vocational courses that impart general skills or that impart a high level of academic content and more likely to be enrolled in occupationally-specific preparation for health, construction, or service-related jobs (Oakes, Selvin, Karoly, and Guiton, 1992).

academic subjects arrested or reversed the shift from academic to non-academic programs that typified the 1970s?

Second, has the earlier trend toward diminished gender sorting in vocational occupational areas continued? These questions are addressed in the analyses presented below. First let us examine changes in placement patterns across program types.

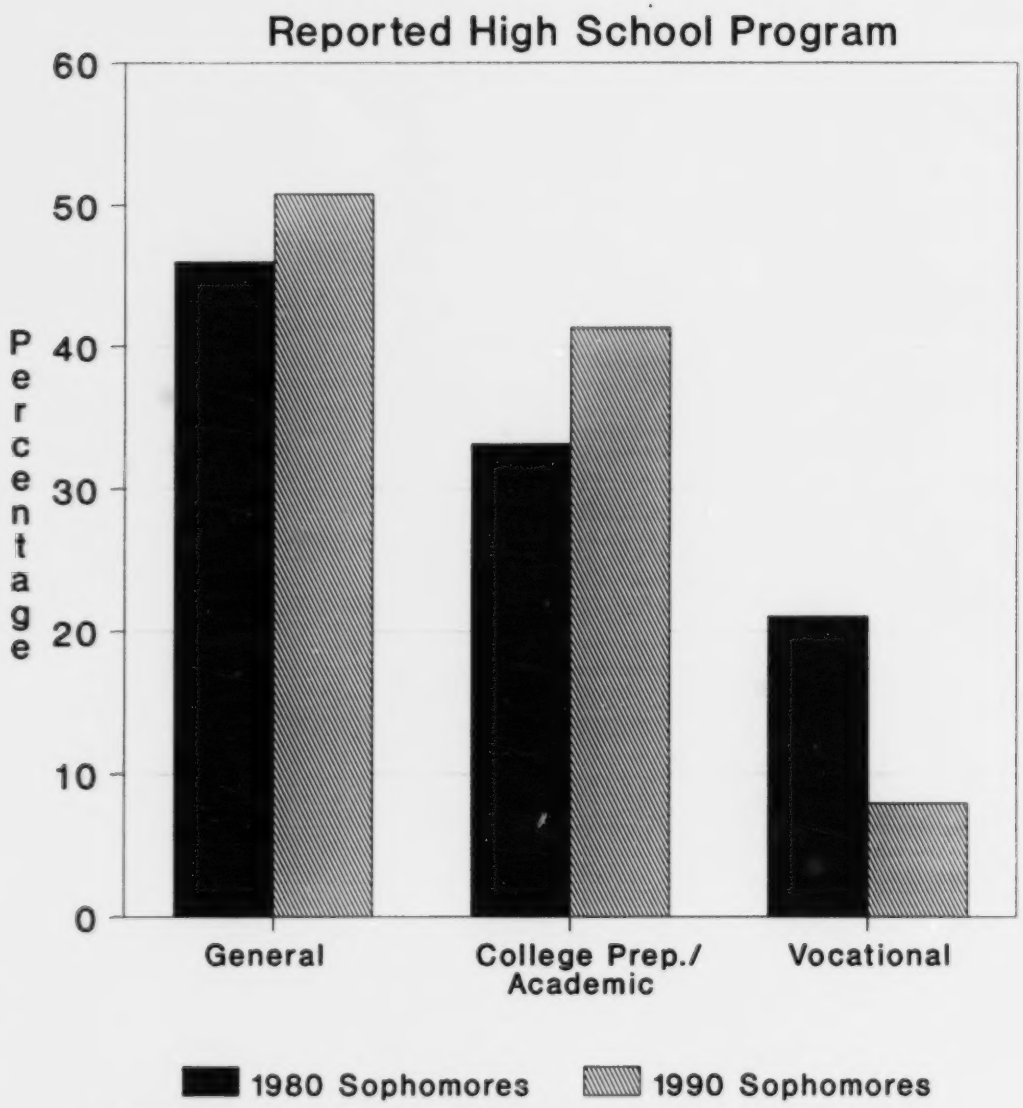
Figure 2.1 provides a comparison of 1980 and 1990 sophomores in general, college preparatory, and vocational programs. A limitation of this analysis of program placement is that it is based on student self-report. The major difficulty with using self-reported program participation data is that students may not know what program they are in, and may report erroneously. This may be especially true for sophomores because they are still relatively new to the high school and may not have as clear an idea of the curricular organization as would juniors and seniors. The preferred analysis of program participation would use student transcripts. However, while HS&B transcript data are available, transcripts for the NELS:88 sample will not be available until mid to late 1993.

Despite the limitations, at least the method of obtaining program participation is consistent across the two samples; self-report is used in both HS&B and NELS. While differences may not entirely reflect actual changes in program participation, they do at least indicate changes in students' perceptions of their programs. Other analyses of transcripts across roughly the same time period offer a modicum of support for the trends reported here. The proportion of coursework attributed to academic courses increased from 66 percent in 1982 to 69 percent in 1987 while the proportion of coursework made up by vocational courses has decreased slightly from 23 percent in 1982 to 20 percent in 1987 (Medrich, Brown, & Henke, 1992, p. 44; see also Tuma, Gifford, Horn, & Hoachlander, 1989; and Hoachlander, Kaufman, & Levesque, 1992).

When compared to their 1980 counterparts, fewer 1990 sophomores report that they are in vocational programs. Overall, the decline in vocational placement is by more than half. Table 2.1 shows that the drop in vocational program placement is consistent for sophomores of both sexes. At the same time that vocational program placement declined, placement in college preparatory programs increased for sophomores, from 33 percent in 1980 to 41 percent in 1990. Far from dramatically decreasing, as reformers might have hoped, program placement in the general curriculum very slightly increased.

General and college preparatory placement has increased, at the expense of vocational program placement. Less than half as many 1990 sophomores (8%) identified their high school program type as vocational education as did so in HS&B ten years before (21%).

Figure 2.1-1980 and 1990 sophomores in general, college prep. or academic and vocational high school program



SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

Table 2.1. Percentages of 1980 and 1990 sophomores in each high school program, by gender

High School Program	All Students		Males		Females	
	1980	1990	1980	1990	1980	1990
General	46.0	50.8	46.4	50.9	45.2	50.7
College Prep.	33.1	41.3	32.5	40.6	35.8	42.0
Vocational	(21.0)	(7.9)	(21.1)	(8.4)	(19.0)	(7.4)
Agricultural	2.9	0.9	4.2	1.6	1.5	0.4
Business or office	7.1	3.4	3.1	2.3	10.3	4.4
Distributive	1.7	0.4	1.6	0.5	1.6	0.4
Health	1.3	0.9	0.9	0.5	1.5	1.3
Home economics	1.7	0.4	0.6	0.3	2.5	0.5
Technical occupations	1.8	0.9	3.0	1.7	0.6	0.2
Trade or industrial	4.5	0.9	7.8	1.6	1.1	0.2

Note: Vocational programs may not sum to vocational totals because of rounding. In addition, columns may not sum to 100 percent owing to rounding.

Sources: HS&B base year student survey (1980) and NELS:88 first follow-up student survey (1990), National Center for Education Statistics, US Department of Education

Table 2.2 shows program shifts by various background characteristics. A remarkable consistency in the drop in placement into vocational programs is seen across groups. In absolute terms, the decline in vocational program placement is particularly large in the public sector, which traditionally has served as the primary delivery system for high school vocational education courses. Though comparatively few Catholic students are in vocational programs at either point in time, the Catholic sector too registered a statistically significant decline in vocational program placement between 1980 and 1990.

Table 2.2. Percentages of 1980 and 1990 sophomores in General, College Prep., and vocational high school programs, by sector, race, SES, and test quartile

Student Characteristics	General		College Prep. or Academic		Vocational	
	1980	1990	1980	1990	1980	1990
All Sophomores	46.0	50.8	33.1	41.3	21.0	7.9
Asian	37.1	42.3	48.8	49.2	14.1	8.5
Hispanic	46.1	55.0	24.6	35.1	29.2	9.9
Black	39.0	42.9	26.9	40.9	34.1	6.2
White	47.4	51.7	35.0	42.0	17.6	6.3
American Indian	51.6	58.5	19.8	22.9	28.7	8.6
Low SES	51.5	57.2	19.0	27.7	29.5	15.2
Middle SES	47.8	51.7	31.0	40.9	22.2	7.5
High SES	36.8	43.1	53.8	54.9	9.4	2.0
Northeast	33.2	41.2	44.7	50.6	22.1	8.2
North Central	44.8	56.7	31.8	36.9	23.4	6.4
South	51.5	48.6	27.1	41.6	21.4	9.8
West	52.2	56.1	32.3	37.6	15.5	6.3
Public	47.3	52.2	30.2	39.1	22.6	8.7
Catholic	32.3	35.9	61.9	62.7	5.8	1.6
Other Private	36.9	43.9	57.6	55.6	5.5	0.5
Lowest Test Quartile	50.1	61.0	12.8	19.6	37.0	9.4
Second Test Quartile	54.1	61.1	22.4	29.2	23.5	9.7
Third Test Quartile	48.1	50.2	37.0	44.4	14.9	5.4
Highest Test Quartile	32.4	35.4	60.9	62.7	6.7	1.9

Note: Owing to rounding, percentages may not sum to 100.

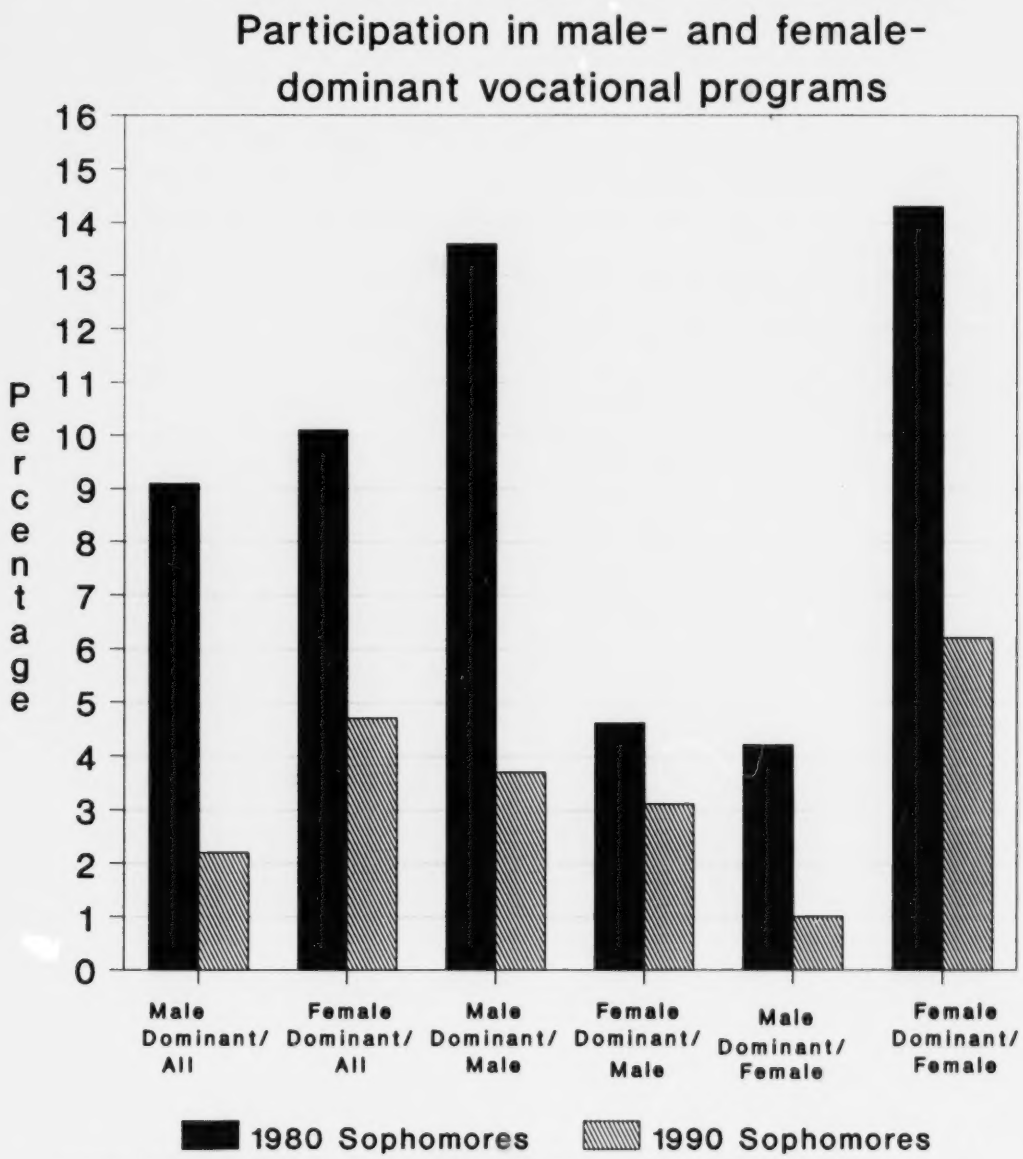
Sources: HS&B base year student survey (1980) and NELS:88 first follow-up student survey (1990), National Center for Education Statistics, US Department of Education

Accompanying the drop in vocational program placement is an increase in placement in general and college preparatory or academic programs. Significant increases in placement into college preparatory high school programs may be seen for students in the public high schools, as well as those in the lower test quartile and socioeconomic status groups. It is particularly interesting to observe more 1990 black and Hispanic sophomores in college preparatory programs. For blacks, at least, the gap with white sophomores has been eliminated. Though 1990 Hispanics increased proportionately in college preparatory programs, Hispanic sophomores still lag behind white sophomores in placement in college preparatory programs.

Vocational programs were categorized as male- or female- dominant based on the number of male and female high school students in those programs in 1972. This scheme was adopted to allow comparability with a previous report by Fetters, Brown, & Owings (1984) in which 1972 and 1980 seniors were compared. Following Fetters, Brown, & Owings (1984, p.12), the three occupational areas within vocational programs which in 1972 contained a greater percentage of males than females (agricultural, distributive, and trade or industrial) were classified as male-dominant. The three occupational programs which in 1972 contained a greater percentage of females than males (business or office, health, and home economics) were classified as female-dominant. It should be noted that in this report and in the report by Fetters and his associates transcript data were not used to classify students into either programs or occupation areas. Both reports rely solely on student self-report of program and area.

For students enrolled in vocational programs, the percentages enrolled in male- and female-dominant vocational programs are shown in Figure 2.2. The figures show the exodus of both male and female vocational high school sophomores from vocational programs. While in 1980, gender sorting in vocational program participation is quite dramatic, this seems to be less the case in 1990. In 1990, boys are in male- and female-dominant programs with equal frequency. However, girls are still disproportionately represented in 1972 female-dominant vocational programs.

Figure 2.2-Percentage of 1980 & 1990 sophomores in male-& female-dominant vocational programs, by gender



SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-Up Student Survey, U.S. Department of Education, National Center for Education Statistics.

Student motivation. One way of gauging motivation to participate in school is to assess the degree to which students come prepared. Questions assessing whether students came to school without their books, pens, pencils, paper and homework were asked of both the 1980 and 1990 sophomore cohorts. Results are shown in Table 2.3. Overall, 1990 sophomores were less likely to report coming to school without books, writing implements, or homework than sophomores in 1980. These differences are particularly noticeable in the public sector.

Table 2.3. Percentages of 1980 and 1990 sophomores saying they usually or often come to school without paper and pencil, books, and/or homework, by student characteristics

Student Characteristics	Come to school without books		Come to school without paper, pen or pencil		Come to school without homework	
	1980	1990	1980	1990	1980	1990
All Sophomores	8.5	6.3	15.1	10.5	22.1	18.1
Male	10.4	7.6	19.6	15.2	27.0	22.4
Female	6.0	5.0	10.2	5.8	16.8	13.8
Asian	13.0	9.5	14.6	11.0	17.1	17.6
Hispanic	13.8	10.9	20.1	13.5	27.7	20.6
Black	13.7	8.1	17.6	9.6	22.9	16.0
White	6.7	5.1	13.9	10.2	21.2	18.1
American Indian	17.5	11.1	25.9	11.8	30.9	21.9
Low SES	11.3	8.4	16.8	10.7	25.1	19.6
Middle SES	7.7	6.4	14.2	9.9	21.5	18.4
High SES	5.5	3.5	13.6	10.8	18.4	15.3
Public	8.9	6.6	15.2	10.2	22.6	18.5
Catholic	4.5	3.4	14.7	10.5	17.2	12.6
Other Private	5.4	4.6	13.6	18.9	17.7	19.8
Lowest Test Quartile	17.1	12.8	21.9	15.1	28.5	23.8
Second Test Quartile	8.1	6.4	14.3	10.0	22.8	19.3
Third Test Quartile	4.8	3.8	12.1	7.8	19.8	16.2
Highest Test Quartile	3.0	2.5	10.8	8.2	16.2	14.3

Sources: HS&B base year student survey (1980) and NELS:88 first follow-up student survey (1990), National Center for Education Statistics, US Department of Education

School safety. Whether schools can provide a safe environment for student learning has been an issue of great concern over the last two decades. One of six recently promulgated national education goals avers that "by the year 2000, every school in America will be free of drugs and violence and offer a disciplined environment conducive to learning." Both HS&B and NELS:88 asked their student samples whether they felt safe at their school. Responses are shown in Table 2.4. Although the overwhelming

Between 1980 and 1990, the percentage of sophomores who reported feeling unsafe in school, declined by a third, from 12 percent of all sophomores in 1980 to 8 percent in 1990.

majority of sophomores at both time points reported that they felt safe in school, some group and cross-time differences are noteworthy. Overall, 1990 sophomores were somewhat more likely to report feeling safe in their schools than were 1980 sophomores. In all sectors, sophomores in 1990 report feeling safer than their respective 1980 counterparts. Higher safety ratings occur in 1990 regardless of student gender, socioeconomic status, and test quartile. When student racial/ethnic classification is considered, 1990 Hispanics, blacks and whites are less likely than their 1980 counterparts to report feeling unsafe in their schools. However, when compared to 1990 whites, 1990 blacks and Hispanics report feeling less safe in their school.

Table 2.4. Percent of 1980 and 1990 sophomores who report that they do not feel safe at their school by student characteristics.

Student Characteristics	1980	1990
All Sophomores	12.2	8.1
Male	13.4	8.8
Female	10.8	5.9
Asian	13.9	9.9
Hispanic	16.2	10.8
Black	17.7	12.9
White	10.7	6.7
American Indian	13.3	10.1
Low SES	15.2	10.8
Middle SES	11.5	8.2
High SES	8.7	5.4
Public	12.6	8.5
Catholic	8.2	4.4
Other Private	8.8	2.8
Test Quartile		
Lowest	19.5	5.8
Second	12.8	9.1
Third	10.0	6.3
Highest	6.1	4.4

Sources: HS&B base year student survey (1980) and NELS:88 first follow-up student survey (1990), National Center for Education Statistics, US Department of Education

CHAPTER 3: MATHEMATICS ACHIEVEMENT

Mathematics has become increasingly important in the information-oriented post-industrial society in which we live. Graphical representations, and mathematical tools such as calculators and computers, have become commonplace. The societal role of science and technology has grown. The importance of quantitative analysis and reasoning to the social sciences--and the economic importance of mathematics in the workplace of an increasingly competitive global economy--are widely recognized.

At the same time, the quality and effectiveness of mathematics education in the United States has continued to be a critical national issue. A number of international assessments[1] have demonstrated that American students, compared to those of other nations, lag considerably in their achievement in mathematics, especially in their higher order problem solving abilities. Such comparisons imply that American schools can be more successful than they have been in producing numerate citizens who have realized their full potential to benefit from thorough mastery of mathematical concepts and modes of reasoning. Efforts at school improvement--in particular, such reforms as increasing the amount of coursetaking in key areas such as mathematics, making the content of such courses more rigorous, and improving the methods by which such courses are taught--have been a prominent feature of the years in which NELS:88 sample members passed through middle and junior high schools and on into high school. While recent NELS:88 and NAEP data suggest that new instructional practices in math are still not widespread, comparisons of HS&B and NAEP transcripts data reveal significant increases in high school enrollment in non-remedial math courses as the 1980s progressed (The Condition of Education 1991, Chart 1.14).

The large-scale national studies initiated by the National Center for Education Statistics provide indicators of how student mathematics performance has changed over time. The National Assessment of Educational Progress (NAEP) and the two longitudinal cohort studies--High School and Beyond (HS&B) and the National Education Longitudinal Study of 1988 (NELS:88)--enable us to measure how students' math performance changed during the decade of the 1980s.

In this chapter we compare mathematics achievement of the 1980 and 1990 sophomore cohorts. The mathematics test was the only cognitive test in the NELS:88 battery that was designed to be linked to the HS&B scores. The linkage was effected by including 16 HS&B mathematics items in the NELS test. In order to compare mathematics performance of the two sophomore cohorts, the mathematics scores from each sample had to be put on the same scale. An explanation of the equating process can be found in Appendix B.

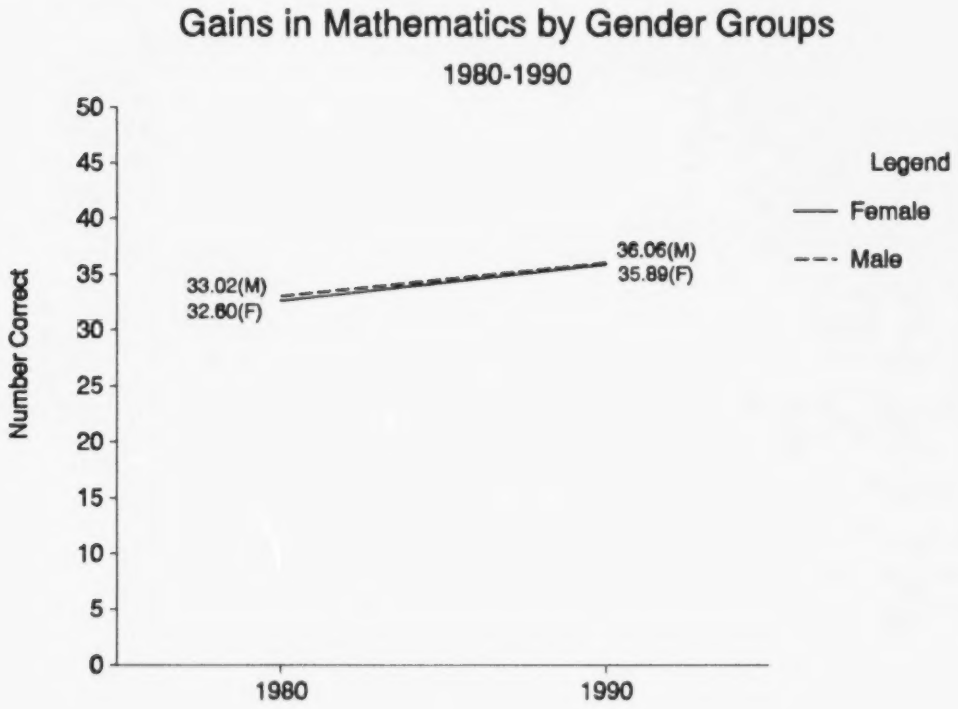
The following figures show gains and losses in mathematics achievement for a number of subgroups. What is of interest is not only whether sophomores showed significant overall change in mathematics proficiency over the ten year period, but whether subgroups which have traditionally lagged in academic achievement have reduced their respective gaps when compared to other subgroups. To put the gains and losses into perspective they are reported in the text in terms of effect sizes. Effect sizes, unlike the standard statistical tests, provide a scale-free measure of relative gain that is independent of

[1]For a summary of findings from international mathematics and science assessments in recent years, and an examination of the statistical limitations and uses of such findings, see the recent NCES report International Mathematics and Science Assessments: What Have We Learned? (1992, Superintentendent of Documents, 065-00487-7).

sample size. The use of effect sizes in conjunction with statistical tests helps to keep to a minimum the potential for interpreting trivial but statistically significant effects in the presence of very large samples. A more detailed explanation of effect sizes, including guidelines for their interpretation, is provided in Appendix B.

Figure 3.1 shows 1980 and 1990 mean achievement in mathematics for male and female students.

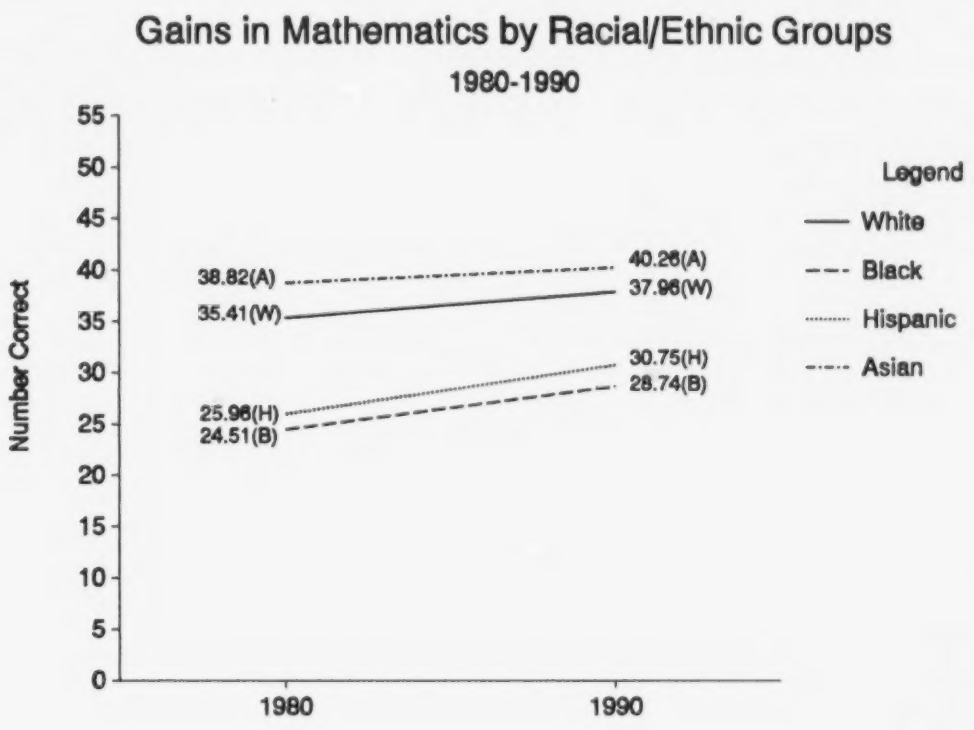
FIGURE 3.1



As a benchmark here, it may be useful to note that for the total population, the HS&B mean was 32.81, the NELS:88 mean was 35.97, and the effect size .26. The effect size of .26 is the simple gain (35.97 - 32.81 = 3.16) divided by the total standard deviation from 1980. The interpretation of the .26 effect size is that on average, sophomore students in 1990 are performing 26% of a standard deviation higher than their comparable cohorts from 1980. Figure 3.1 indicates that both gender groups showed significant gains in mathematics achievement during the 1980s. (The effect size for differences between HS&B and NELS:88 males is .25; for females, .27.) The difference between the two gender groups in the relative amount of gain achieved is not significant. That is, the parallel lines suggest what the statistical test confirms -- the amount of gain was the same for male and female members of the 1990 cohort.

Mean achievement levels for 1980 and 1990 sophomores in the four racial/ethnic groups are presented in Figure 3.2.

FIGURE 3.2

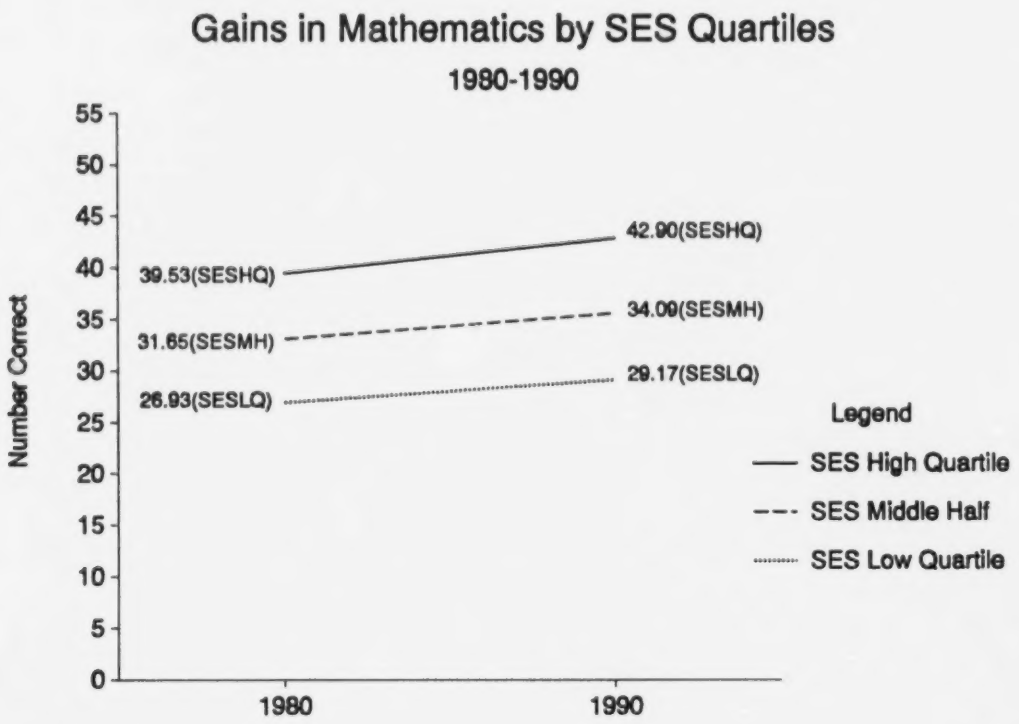


All groups with the exception of the Asian students made statistically significant gains in mathematics achievement. Both Hispanic and black students gained more than white and Asian students. In terms of effect sizes the gains were .39, .12, .35, .21 for the Hispanic, Asian, black, and white students respectively. Clearly the gap between black and white students and Hispanic and white students was reduced during the 1980s.[2] It should be kept in mind that the minority-majority gap narrowed not because the whites did not gain, but because the Hispanics and blacks gained proportionately more during the 1980s.

[2]More precisely, the gap between Hispanic and white students in 1980 was .77 of the 1980 total standard deviation while the corresponding difference in 1990 was .59 of the 1990 total standard deviation. Similar figures for the black and white student comparison showed that the achievement gap went from .89 of a standard deviation in 1980 to .75 of a standard deviation in 1990.

Three socioeconomic groups were formed by dividing the socioeconomic status composite into quartiles and collapsing the middle two quartiles. The combining of the two middle quartiles was done to simplify the graphics. Figure 3.3 shows the mean achievement levels for 1980 and 1990 sophomores in the three SES groups.

FIGURE 3.3

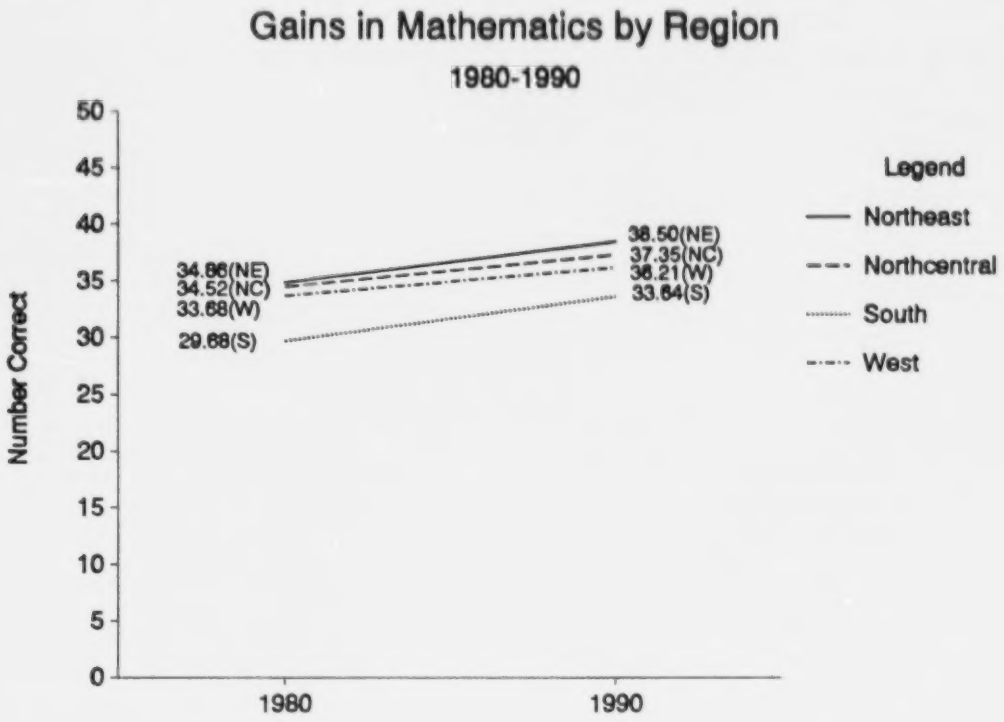


Students in the 1990 cohort from each of the three socioeconomic status groups made significant gains in their mathematics achievement compared to their 1980 counterparts.[3]

[3]There was a statistically significant interaction between year and SES quartile suggesting that there was some differential gain. In terms of standard deviation units the gains were .18, .21, and .27 for quartile 1 (lowest quartile) through quartile 4 respectively. On the surface it would appear that the highest quartile gained more than the lowest quartile, but about 12 percent of the lowest quartile in 1990 were missing mathematics scores while virtually all the 1980 lower quartile had mathematics scores. Given the discrepancy between the effect sizes of the quartiles versus the overall effect size it would appear that the estimate of the lower quartile's gain may be biassed downward due to the missing mathematics scores in 1990. Thus any interpretation of differential gain would be inappropriate. See Appendix A, Table 3.1, for further documentation.

Figure 3.4 presents mean achievement levels for the 1980 and 1990 cohorts in different regions of the country.

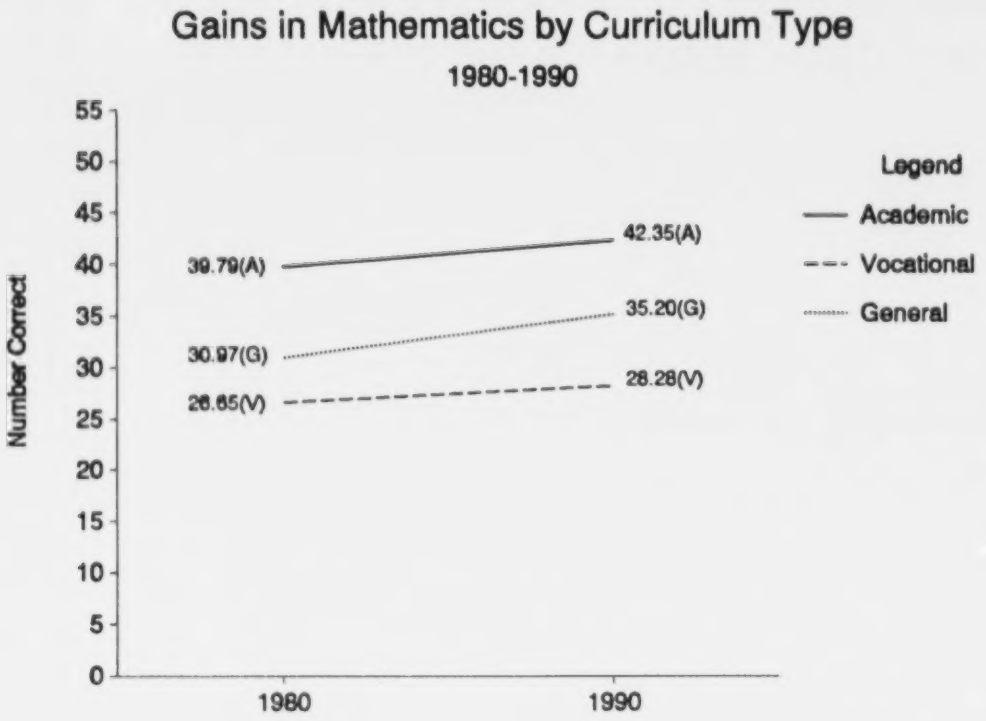
FIGURE 3.4



Students in all four regions made statistically significant gains in mathematics achievement. The effects sizes of the gains were .30, .23, .32, and .21 for the Northeast, North Central, South and West respectively. Students in the South showed a slightly greater increase from cohort to cohort than students in the West. It should be noted here that there has been some shift in population to the South and to a lesser extent to the West during the 1980s and at the same time a shift away from the Northeast and Northcentral regions. It is possible that any differential gains may at least in part be due to selective population shifts rather than the result of any change in educational process that might be identified with any given region.

Figure 3.5 presents mean achievement levels for the 1980 and 1990 cohorts in different high school programs.

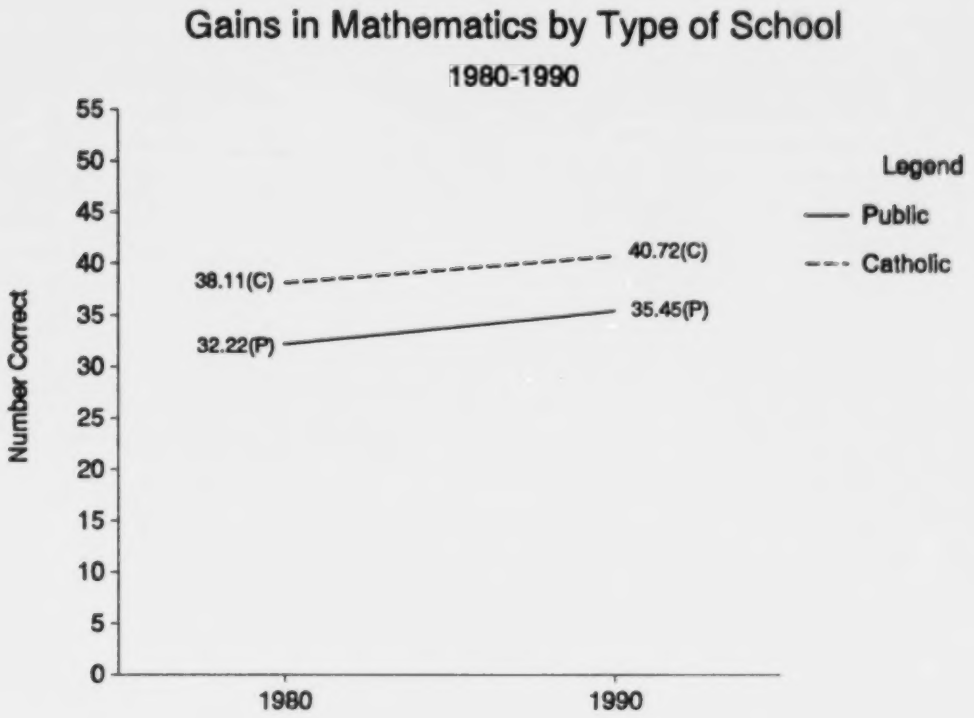
FIGURE 3.5



Students in all three curriculum programs showed significant gains. (The effect sizes were .35, .21, and .13 for general, academic, and vocational students respectively.) There were differential positive shifts from cohort to cohort. Inspection of the effect sizes indicate that the students in the general curriculum gained more than did the students in the vocational technology program. It should be noted here that there was a considerable shift of students from vocational education to general and academic programs during the 1980s. As in the case of regions at least part of the differential gain may be due to selective population shift from the vocational to the general program.

Figure 3.6 presents mean achievement levels for the 1980 and 1990 sophomores in public and Catholic schools.

FIGURE 3.6



While both groups of students showed statistically significant gains, there was no statistical evidence for differential change during the 1980s. The effect sizes were .26 and .21 for public and Catholic school students respectively.

Summary. The 1980s found America's sophomores gaining in their mathematical achievement. Virtually all demographic groups shared in these gains. On average sophomores gained about a quarter of a standard deviation unit. Some groups gained proportionately more than others. Black and Hispanic students showed proportionately greater gains in mathematics achievement than did white or Asian students. While the achievement gap was significantly reduced between minority and majority groups due to the differential gains, Hispanic and black students in 1990 were still performing at 60 and 75 percent of a standard deviation unit below white students, respectively.

Sophomores in the general curriculum gained significantly more than did students in the vocational program. Contrasting groups showing essentially **equal** growth rates were males and females, and students attending Catholic and public schools

While on average students did demonstrate significant growth in their mathematics achievement during the decade of the 1980s, the data can not by itself pinpoint where in the decade the growth took place. Trend results from the National Assessment of Educational Progress (Mullis, Dossey, Foerstch, Jones & Gentile, 1991) provide additional data points to help pinpoint when the gains were actually occurring.

CHAPTER 4: AFTER-SCHOOL ACTIVITIES

In this chapter we compare participation in a number of after-school activities that may have an impact on sophomores' education. Data are available for only a limited number of these activities. Unfortunately comparable data (for 1980 and 1990) are not available for two important after-school activities, jobs and homework. However, data are available for **extracurricular school-sponsored activities** and for **recreational activities outside of school**.

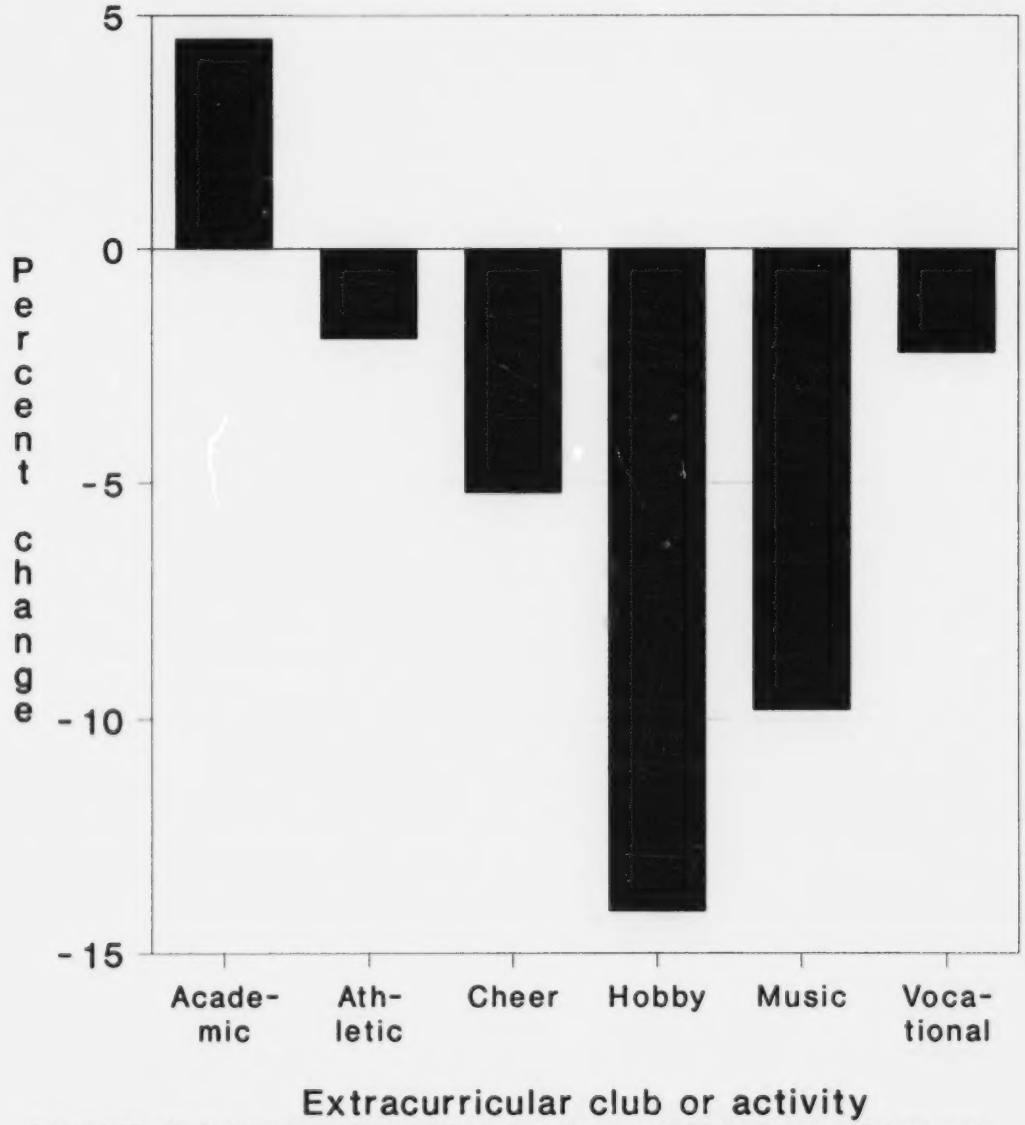
Extracurricular activities. High schools offer a number of opportunities for extracurricular education experiences. Typically, these are in the form of clubs organized around some topic or activity. Educators have long been interested in the ways that extracurricular activities can affect academic performance and social development.

Traditionally, participation in school-sponsored extracurricular activities has been considered an indicator of greater interest in school and subsequent higher achievement. However, it is possible that extracurricular influences may be negative (for example, athletic activities may be a significant distraction from the academic purposes of school) or positive (for example, athletic activities may foster school spirit and personal development, may contribute to athletes persisting in their schooling and performing well academically, and may improve race relations). Past studies have therefore investigated the effects of athletic, aesthetic or expressive, and academic extracurricular engagement on adolescent self-esteem and feelings of control over one's life, on race relations, political socialization, academic achievement, educational aspirations, and on delinquency rates (Holland & Andre, 1987). Data from NLS-72 and HS&B have been used both to measure the effects of extracurricular participation, and to better understand the processes through which extra-academic participation may lead to positive educational and developmental outcomes. NELS:88 data will further contribute to our knowledge of this important topic of investigation. Our focus, below, will be to depict patterns of continuity and change in American sophomores' extracurricular participation between 1980 and 1990.

Figure 4.1 shows the percent change in reported participation in a number of extracurricular activities from 1980 to 1990. Overall, participation in academic clubs has increased, while participation in many other types of activities has decreased. A detailed examination of participation is shown in Table 4.1. As shown in Table 4.1, increased participation in academic clubs is predominant among white students and students in the middle and upper socioeconomic status groups.

Reported participation in academic clubs has increased, from 26 percent of the 1980 sophomore class, to around 31 percent of the nation's 1990 sophomore class. However, some other forms of extracurricular involvement have declined--some 21 percent of 1980 sophomores belonged to hobby clubs, but only 7 percent of the 1990 cohort. Participation in musical activities declined from 31 percent of 1980 sophomores, to 22 percent of 1990 sophomores.

Figure 4.1-Percentage of change (1980 to 1990) in participation in school-sponsored extracurricular activities



SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics

Table 4.1. **Percent of 1980 and 1990 sophomores who participate in a variety of school-sponsored extracurricular activities, by student characteristics.**

Student Characteristics	Academic Clubs		Athletics		Cheer leading		Hobby Clubs		Music		Vocational Clubs	
	1980	1990	1980	1990	1980	1990	1980	1990	1980	1990	1980	1990
All Sophomores	26.2	30.7	54.1	52.2	14.3	9.1	21.4	7.3	31.3	21.5	13.9	11.7
Male	22.7	27.4	63.4	63.0	3.3	2.1	25.5	7.9	21.5	15.6	11.5	11.0
Female	29.1	34.0	45.9	41.4	24.7	15.8	17.6	6.7	41.0	27.3	15.7	12.3
Asian	31.8	36.7	46.3	54.9	7.0	5.2	25.5	11.8	28.4	20.6	5.3	5.1
Hispanic	27.6	27.2	48.3	43.9	13.2	8.3	22.7	6.7	28.4	14.8	13.2	7.4
Black	28.9	26.2	57.1	51.4	17.1	15.7	21.7	5.2	37.9	23.0	17.5	13.7
White	25.3	31.7	54.4	53.5	14.1	8.3	21.0	7.5	30.5	22.3	13.5	12.2
American Indian	29.5	31.9	56.8	44.2	12.9	11.3	26.5	8.4	33.7	17.3	20.0	16.9
Low SES	25.2	26.3	43.7	42.0	13.2	8.2	19.6	5.8	27.6	18.3	18.0	17.1
Middle SES	26.3	31.5	55.1	52.7	15.1	9.6	22.3	7.1	31.5	22.1	14.8	11.4
High SES	26.9	34.9	64.4	63.2	14.4	9.3	21.4	9.4	35.2	24.4	7.9	6.5
Northeast	21.4	26.9	54.5	55.7	11.8	8.0	20.5	11.0	29.4	22.7	7.4	3.5
North Central	28.5	33.4	51.5	58.3	15.5	8.6	21.7	5.4	30.9	26.6	19.2	11.7
South	27.6	32.6	55.2	46.3	15.7	11.3	20.3	5.9	33.8	18.8	16.9	18.6
West	26.4	27.5	54.9	51.6	13.0	6.8	24.5	8.7	28.9	18.2	9.5	7.2
Public	26.0	31.0	53.1	50.8	14.2	9.2	21.3	6.7	31.3	22.1	14.9	12.6
Catholic	27.7	28.6	61.8	66.5	15.9	7.1	21.2	12.3	28.4	12.6	3.6	2.8
Other Private	27.3	29.1	68.8	68.0	13.1	9.9	24.4	13.1	35.9	25.7	6.5	5.5
Test Quartile												
Lowest	27.5	22.5	47.0	47.4	15.0	9.5	22.9	6.5	29.6	16.0	20.6	17.3
Second	25.7	29.9	53.3	50.8	14.8	8.6	22.7	6.1	29.7	20.5	16.2	13.2
Third	24.4	30.3	56.4	51.8	15.1	9.2	21.1	7.6	31.2	22.1	12.6	11.4
Highest	27.9	40.0	60.5	59.0	13.4	9.0	18.6	8.7	35.8	26.9	7.7	6.7

Sources: HS&B base year student survey (1980) and NELS:88 first follow-up student survey (1990), National Center for Education Statistics, US Department of Education

The decrease in reported participation in activities may be due to program cuts. There is no reason to believe that, in general, high schools were financially better off in 1990 than in 1980, and extracurricular programs are often the first to be cut for budgetary reasons. Unfortunately, there is no unambiguous way of separating student-initiated nonparticipation from program unavailability, because program unavailability, while assessed in NELS, was not asked in HS&B. The percentage of students in the entire NELS:88 First Follow-Up sample (a sample slightly different from the one used in this report) indicating that various programs were unavailable at their schools was as follows: Academic, 4.5 percent; Athletic, 1.6 percent; Cheerleading, 5.0 percent; Hobby Clubs, 16.4 percent; Music/Theater/Dance Programs, 3.5 percent; and Vocational Clubs, 11.5 percent. While the unavailability of programs in 1990 could account for declining participation, the fact that there is no comparable program unavailability data from HS&B to use as a basis for comparison makes it impossible to draw such a conclusion from these data.

Television viewing. Television has been both praised and criticized for its influence on American youth. Proponents of educational television have trumpeted the ability of the media to reach into homes and provide educational materials in an engaging format. Critics of television have expressed fears that programs promote antisocial values, highlight gratuitous violence, and offer fare that is predominantly devoid of serious intellectual content. Apart from the issue of program content and its effects on youth, many parents and educators fear that the average teenager simply watches too much television, keeping him or her from reading, studying, doing homework, or engaging in constructive socialization. The recent introduction of videotape machines has broadened the range of viewing possibilities, and may have increased the appeal of televised media to youth.

Both the HS&B and NELS:88 surveys asked respondents to report on how much television they view, on average, during school nights. A comparison of viewing time for 1980 and 1990 sophomores is shown in Figure 4.2. Overall, nine percent of 1990 sophomores report viewing more than five hours of television (including videotapes) on an average school night. This is a substantial reduction from the more than 27 percent of 1980 sophomores who reported that level of viewing. Table 4.2 provides a more detailed examination of television viewing. The reduction is apparent in each of the categories. The reduction is significant for each group in the table with the exception of the American Indian/Alaskan Native subsample, for which sample sizes are very small. However, it is possible that this trend is an artifact of the wording of the 1980 item.[1] This finding should therefore be viewed with caution.

If television viewing displaces other, more cognitively beneficial activities, it is to be feared that television may have a negative effect on achievement. In their analyses of NELS:88 first follow-up data, for example, Rock and Pollack (1992) report that those who did not spend large amounts of time watching TV on weekdays demonstrated the highest levels of cognitive skills.[2] A negative relationship between time viewing television and some aspects of tested achievement (particularly mathematics proficiency) also was observed in analyses of NELS:88 base year data (Rock, Pollack & Hafner, 1991). These analyses are bivariate, however, and like the descriptive analyses in this report, not multivariate analyses that may help to elucidate a causal model. Bivariate analyses can show us that television viewing and achievement are negatively correlated for individuals within a particular age and grade range, but only by including other variables related to television viewing and achievement in the analytic model can one confirm that television viewing as such has negative effects on attainment.

Though simple correlations do point to a negative impact of TV-viewing on achievement, when other variables are taken into account, neither a negative nor a positive association is sustained. For example, multivariate longitudinal analysis of HS&B data (Gaddy, 1986) showed neither a positive nor a negative effect of television-viewing on high school achievement, though TV was found to be relatively

[1]See Appendix B for a discussion of possible problems with the HS&B item assessing television viewing. Readers are strongly urged to review the reasons for suspecting that these items may not be truly comparable before giving weight to the conclusions based on this comparison.

[2]While the analyses of Rock and Pollack indicate that moderate TV-watching was not negatively associated with school achievement--NELS:88 first follow-up data show that students who watched TV for one to two hours on weekdays had average scores almost identical to those who watched for less than one hour or not at all--higher amounts of time spent watching TV were associated with significantly lower test scores at tenth grade in all subject areas, particularly for the 17 percent of students who watched TV for four or more hours each day. (Differences in gains in achievement since eighth grade, however, were not large enough to be statistically significant.) For students who reported watching no TV or less than one hour on weekdays, the relatively high test score standard deviation hints at the possibility of a bimodal distribution. This category may include a mixture of high-achieving students who are using their time for education-related activities, and also some low achievers who do not have access to television on a regular basis. As noted above, the statistically significant results reported by Rock and Pollack do not reflect the imposition of longitudinal controls or consideration of intervening variables.

less beneficial than reading for pleasure. Subsequent studies of other nationally representative longitudinal data support Gaddy's HS&B findings (most notably, the conclusions of Gortmaker, Salter, Waker and Dietz [1990] of no causal relationship between the amount of television viewed and the mental aptitude and achievement test scores of adolescents). Thus, a change in viewing patterns over time such as the one reported here, or a correlation between viewing and achievement such as the one reported in the cited **bivariate** analyses of NELS:88 data might be better explained by who watches great amounts of television than by how much television is viewed. Other variables, such as family socioeconomic characteristics, should be taken into account before policy conclusions are drawn.

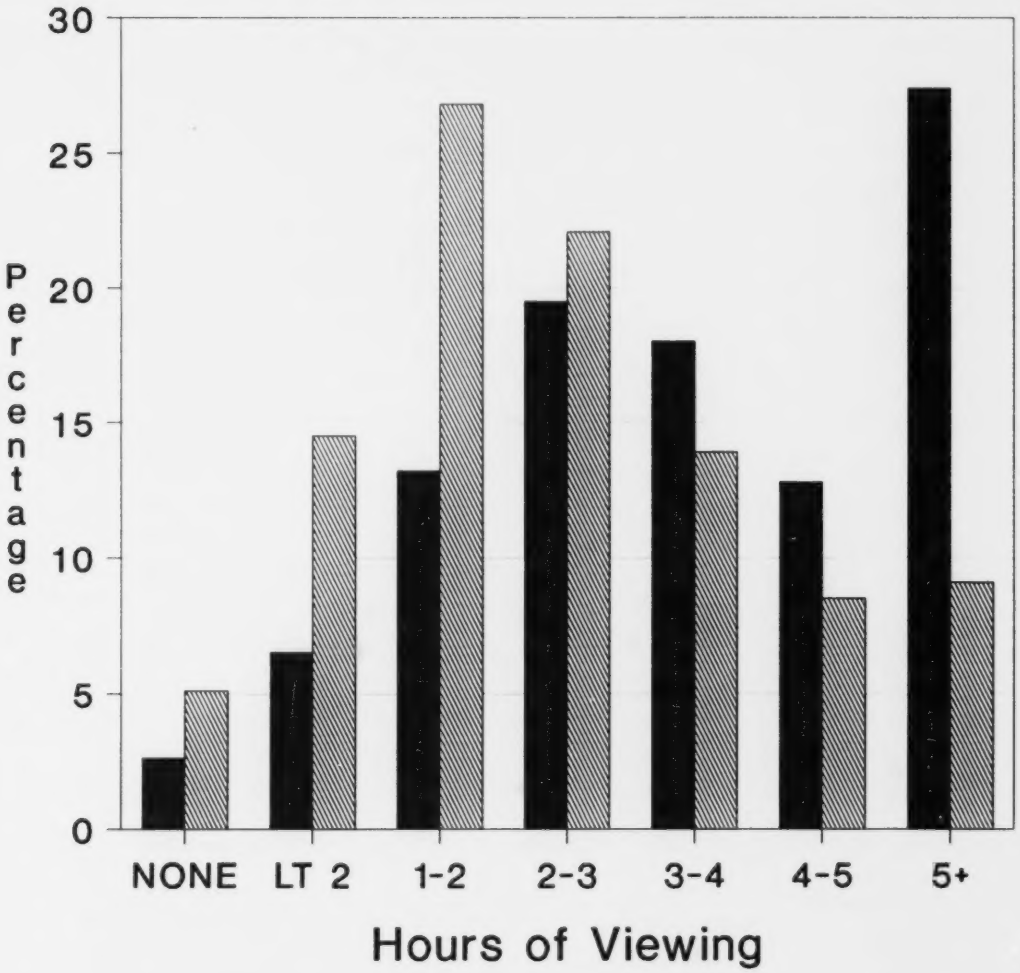
Reading for pleasure. Adolescents' leisure media use is an important topic since behaviors such as television viewing and reading newspapers or books are (unlike many other potential determinants of achievement) malleable. Much more needs to be understood about the mechanisms and processes through which television may affect achievement, a task that rich longitudinal datasets such as HS&B and NELS:88 may contribute to importantly. Reading for pleasure is an important leisure time activity that, unlike television viewing, is consistently positively correlated with educational achievement (Gaddy, 1986). Regardless of whether television viewing has declined, increased, or remained steady, it would be enormously encouraging to learn that sophomores' time spent in reading for pleasure has increased. Unfortunately, comparison of HS&B and NELS:88 data suggests that it has not. For both cohorts, fewer than half of sophomores reported reading for pleasure even as little as once or twice per week.

Fewer than half (41%) of 1980 sophomores indicated that they read for pleasure at least once or twice a week; the same low percentage (41%) of 1990 sophomores reported reading for pleasure at least once or twice a week.

Other after-school activities. A number of questions asked sophomores to report what they do with their time out of school. While it would be interesting to focus on whether sophomores are doing more homework now, than their 1980 counterparts did, or whether they are more likely to be working at jobs after school, unfortunately there are no comparable data on these two activities. However, there are comparable data on other activities. Both 1980 and 1990 sophomores were asked how much time they spend driving or riding around, visiting with friends at a local hangout, talking with friends on the telephone, and reading for pleasure. Results are shown in Table 4.3. Overall, only driving or riding around and talking with friends on the telephone has increased. For driving around, significant increases are seen among whites and blacks, but not among the other racial/ethnic groups. Increases are also seen among the low and middle SES groups, and among public and Catholic school sophomores. Though the differences are significant for sophomores in each of the four test quartiles, the differences are greatest for sophomores in the lowest three quartiles. Differences are greatest in the northeast and north central states.

For talking on the telephone with their friends at least once or twice a week, significant differences were found for male respondents who seem to be catching up to the consistently higher level of such activity shown by female sophomores of both cohorts. There was no significant change in reports of visiting with friends at a local hangout, either overall or for any of the subgroups listed in Table 4.3.

Figure 4.2--Hours of television viewing on week days for 1980 and 1990 sophomores



SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

Table 4.2. Percent of 1980 and 1990 sophomores who say they watch five hours or more of television on school nights, by student characteristics.

Student Characteristics	Watch 5 or more hours	Watch more than 5 hours
	1980	1990
All Sophomores	27.3	9.1
Male	29.1	10.2
Female	24.9	8.0
Asian	23.5	6.9
Hispanic	27.3	10.2
Black	39.8	23.0
White	25.1	6.7
American Indian	26.5	15.8
Low SES	34.4	13.5
Middle SES	27.4	9.5
High SES	19.1	3.4
Northeast	26.5	8.0
North Central	33.2	8.1
South	27.0	11.3
West	22.0	7.7
Public	28.1	9.6
Catholic	21.2	5.8
Other Private	18.7	1.8
Test Quartile		
Lowest	35.3	17.9
Second	31.7	11.8
Third	25.6	5.9
Highest	18.1	3.2

Sources: HS&B base year student survey (1980) and NELS:88 first follow-up student survey (1990), National Center for Education Statistics, US Department of Education

Table 4.3. Percent of 1980 and 1990 sophomores who say they engage in various activities at least once or twice a week, by student characteristics.

Student Characteristics	Just driving or riding around		Visiting with friends at a local hangout		Talking with friends on the telephone		Reading for pleasure	
	1980	1990	1980	1990	1980	1990	1980	1990
All Sophomores	47.1	56.1	67.2	66.3	76.6	80.1	41.1	41.0
Male	51.0	57.9	69.4	69.5	66.5	72.5	34.3	33.8
Female	43.3	54.3	65.2	63.1	86.2	87.7	47.9	48.2
Asian	31.5	44.0	55.3	57.1	67.7	78.3	50.4	40.2
Hispanic	46.6	47.6	60.2	59.3	68.6	72.4	36.3	38.2
Black	38.0	50.1	64.8	59.1	73.3	79.6	46.6	41.2
White	49.0	58.9	68.7	68.7	78.4	81.7	40.4	41.5
American Indian	51.6	53.3	62.2	70.4	59.4	65.1	41.8	39.5
Low SES	43.1	55.1	61.2	62.6	68.6	72.2	37.0	37.4
Middle SES	49.5	58.3	68.7	68.0	78.2	81.9	40.7	40.4
High SES	47.2	52.0	70.8	66.2	83.0	83.5	46.7	46.1
Northeast	37.8	45.3	69.6	69.2	76.7	82.9	42.6	46.0
North Central	49.9	60.3	65.7	67.8	77.1	80.9	40.3	41.6
South	50.3	60.9	67.3	64.9	76.5	79.6	39.8	37.9
West	48.8	52.5	65.6	63.7	75.7	77.6	42.8	41.3
Public	47.7	57.1	66.9	65.9	76.1	79.9	40.9	40.9
Catholic	40.3	51.6	71.4	75.8	81.7	86.8	41.4	41.0
Other Private	43.9	39.6	65.3	58.7	79.2	77.6	43.8	45.6
Test Quartile								
Lowest	48.9	59.6	65.0	66.1	72.3	74.8	30.7	27.7
Second	51.1	62.0	69.1	69.0	77.3	80.9	34.3	36.3
Third	47.9	57.8	69.7	68.5	78.9	83.9	40.3	42.4
Highest	39.7	45.8	64.8	61.1	78.2	80.4	57.8	55.8

Sources: HS&B base year student survey (1980) and NELS:88 first follow-up student survey (1990), National Center for Education Statistics, US Department of Education

CHAPTER 5: SELF-PERCEPTIONS, SOCIAL IMAGE, AND VALUES

High school is also a time for social and personal development, perhaps especially in the sophomore year. At this midway point through adolescence, sophomores are forming important values relating to themselves, their social group, and the larger world in which they will soon occupy positions of increasing responsibility and authority. Because these values may have an impact on sophomores' future behaviors, which in turn may have a profound impact on the shape of future society, they are well worth examining. A number of questions contained in both HS&B and NELS:88 allow us to examine values of the 1990 sophomore cohort and to contrast them to their 1980 counterparts.

The value questions are divided into four thematic groups: (1) how sophomores view themselves, (self-esteem), (2) how effective sophomores feel as agents or actors in their worlds (locus of control), (3) how they think others view them (social image), and (4) their aspirations for themselves and society (life values). An abbreviated version of the value statements, and the percent of each cohort who agreed with the statement, is shown in Table 5.1

Five statements measuring self-esteem were included in both HS&B and NELS. Three of these statements projected a positive self-image, while two projected a negative self image. Sophomores in 1990 are consistently more likely to make positive statements, and less likely to make negative statements about themselves, when compared to sophomores in 1980. A greater percentage of the 1990 group reports feeling good about themselves, being satisfied with themselves, and judging themselves favorably in relation to others. Conversely, fewer 1990 sophomores report feeling they are no good, or that they have little of which to be proud. Although the proportions changed somewhat between 1980 and 1990, overall, both HS&B and NELS:88 sophomores tended to agree with positive self-esteem items and disagree with negative items, with only a small minority choosing items indicative of low self-esteem. However, some variation may be seen across cohorts. The proportion agreeing strongly with items indicative of a positive self-concept increased significantly between 1980 and 1990.

1990 sophomores were even more inclined to endorse items indicative of high self-esteem than were sophomores from the earlier decade. In particular:

- ***The proportion of sophomores who agreed strongly that they felt good about themselves increased from 30 percent to 35 percent;***
- ***the proportion agreeing strongly that they were a person of worth showed the same increase (from 30% to 35%);***
- ***the proportion agreeing strongly that they were satisfied with themselves rose from 20 percent to 28 percent.***

Both groups of sophomores were given items measuring what psychologists have called "locus of control". According to psychological theory, individuals who are high on this dimension, or have an internal locus of control, feel that they are in control of events that have an impact on their lives.

Individuals who are low on this dimension, or have an external locus of control, feel that events and others control them.

Just as 1990 sophomores report feeling more positive about themselves, they also report feeling more in control of their lives, compared to sophomores in 1980, although the difference is not as large as for self-esteem. This is apparent for two of the four locus of control items, the one asking about the role of chance and luck in success, and the other asking about the likelihood that obstacles stand in the way of their success. A recent study of the locus of control scale used in the NELS:88 and HS&B surveys (Kaufman, Rasinski, Lee, & West, 1991), indicates that the locus of control questions measure two somewhat independent dimensions, one indicating the role of chance and luck in one's life, and the other concerning one's own personal efficacy and the obstacles others put in their way. The items in this comparative study include one from the first dimension and three from the second. Taking into account this more complicated view of the locus of control concept, 1990 sophomores appear more likely to believe they can best fate through hard work. They are also less likely than the 1980 cohort to believe that other people will act as obstacles to their success. However, they are just as likely as the 1980 cohort to be pessimistic about their own powers of efficacy.

A number of questions asking students to report how they think others see them were included in both surveys. Together, the questions make up the sophomores' social image. Sophomores in 1990 were as likely as those in the 1980 group to think they were seen as popular, good students, part of the leading crowd, and trouble makers. Happily, the proportion indicating they were seen as trouble makers was quite low in both cohorts. Sophomores in 1990 were more likely than the 1980 sophomores to think others saw them as athletic, socially active, and important.

Finally, sophomores from both cohorts were asked about personal and social values. Among other things, they were asked to indicate how important it was to them to have money, friendship, children, be able to correct social inequalities, and to give their children a better life. The complete list of life values is presented in Table 5.1.

Fewer 1990 than 1980 sophomores indicated that marriage and family were important. In 1990, more students reported "friendship" as very important than reported marriage and family as very important--a marked change from 1980. More 1990 sophomores indicated that money was important. The 1990 sophomores are apparently more willing to forgo leisure in deference to doing whatever it takes to make the money they seem to value. The 1990 group is more likely than the 1980 group to value having children and being able to give children a better life, though marginally less inclined to endorse marriage and family as a very important life value. Despite the increased importance accorded money, and the decreased importance accorded marriage and family, 1990 sophomores, though to a lesser degree than their counterparts ten years before, rated marriage and family above money in importance. In what appears to be a paradoxical result, the 1990 group is both more likely to want to live close to their families and to leave the area of the country in which they resided as sophomores. (This paradox may be laid to rest, however, by considering the extremely small proportion of sophomores--at best, less than a quarter--who affirm either value.) Finally, compared to the 1980 group, the 1990 sophomores are more likely to endorse the importance of correcting social inequalities, though even for the 1990 cohort, only 19 percent rated this value as very important.

Despite the overall similarity in the pattern of affirmations, there were a number of statistically significant shifts in the proportions of sophomores according high importance to particular life values. For example:

- ***Marriage and family was rated as very important by 83 percent of sophomores in 1980 but only 72 percent of 1990 sophomores-- behind* work and friendship in importance.**

- ***Making money was rated as very important by 35 percent of 1980 sophomores but by 44 percent of 1990 sophomores.***

- ***Having leisure time was rated as very important by 70 percent of 1980 sophomores but by somewhat fewer (65 percent) 1990 sophomores.***

- ***Correcting inequalities was felt to be very important only by 14 percent of 1980 sophomores; 19 percent of 1990 sophomores felt that correcting social inequalities was very important.***

Table 5.1. Summary of changes in perceptions and values of high school sophomores: 1980 and 1990

Variable	1980	1990
A. Self-esteem (percentage *agree strongly*)		
Feel good about myself	29.9	35.0
Person of worth, equal of others	29.4	35.1
Satisfied with self	20.3	27.6
I'm no good at all	8.4	5.2
Not much to be proud of	4.0	3.2
B. Locus of control (percentage *agree strongly* or *agree*)		
Good luck more important than hard work	15.5	11.9
Every time I try to get ahead, something stops me	29.8	26.1
My plans hardly ever work out	22.1	21.1
When I make plans, I can make them work	80.1	79.6
C. Social image (percentage responding *"others see me as [very] ..."*)		
Popular	12.4	13.2
Athletic	18.0	20.4
Socially active	19.7	24.9
A good student	28.6	29.3
Important	14.6	20.3
A trouble-maker	3.6	4.4
Part of the leading crowd	14.6	15.9
D. Life values (percentage believe *very important*)		
Work success	85.3	84.8
Marriage/family	82.9	76.7
Money	34.6	43.6
Friendship	81.5	80.2
Steady work	84.4	84.8
Giving my children better opportunities	72.5	75.3
Living close to parents/relatives	20.8	24.4
Leaving this area	14.4	18.3
Correcting inequalities	14.4	18.8
Having children	40.8	43.4
Leisure time	70.0	65.2

Sources: HS&B base year student survey (1980) and NELS:88 first follow-up student survey (1990), National Center for Education Statistics, US Department of Education.

CHAPTER 6: PLANS AND EXPECTATIONS

Despite many similarities, the 1990 sophomores do differ somewhat from their counterparts from a decade earlier in their educational experience and their concerns and values. We have seen that the 1990 group is slightly more monetarily ambitious and more interested in correcting social inequalities. NELS:88 sophomores also are more likely to describe themselves as enrolled in an academic program. The number of students indicating an extremely low level of engagement with school has diminished. It seems reasonable to ask whether these differences carry over into their plans for future education and employment. Are the 1990 sophomores more likely to be college-bound? Do they foresee immediate or delayed entry into the postsecondary education system? What sorts of occupations have they set their sights on?

In this chapter we examine the educational and occupational expectations of the 1990 sophomore cohort, again by contrast with the 1980 group. First we examine the data to determine whether plans for postsecondary education are different. Next we compare plans for timing their postsecondary education. A series of items asked of both cohorts allows us to determine whether the career advice of the 1990 group is different from that received by the 1980 group. Finally we compare the occupation goals of the two groups by looking at what sorts of occupations they think they will be engaged in at age 30.

Table 6.1 shows the postsecondary education plans of 1980 and 1990 sophomores. Compared to the 1980 group, the 1990 sophomores are substantially less likely to say they will end their education by dropping out of high school or with their high school degree. The 1990 sophomores are more likely to say they will go on to complete a bachelor's or advanced degree (59% for NELS:88 tenth graders, 41% for HS&B). This pattern is consistent across demographic and background characteristics except for the following groups: Asians, American Indians, and sophomores in non-Catholic private schools. Asians had high expectations in the 1980 cohort. The lack of difference between the 1980 and 1990 groups simply indicates that their expectations are still high. Indeed, it is as if the other groups are simply catching up to these traditionally high achievers. The data for American Indians and for sophomores in non-Catholic private schools also show an increase in expectations across the decade. However, the sample sizes are too small for these two groups, and the standard errors too large, for these differences to show significance on the statistical test.

1990 sophomores are significantly more likely to say they will go on to complete a bachelor's or advanced degree. For college graduation, the proportion increases from 23 percent in 1980 to 32 percent in 1990; for a postgraduate degree, the proportion increases from 18 percent in 1980 to 27 percent in 1990.

Table 6.2 shows comparative data for the two cohorts in terms of their plans for beginning postsecondary education. Compared to the 1980 cohort, the 1990 sophomores are more likely to say they will attend college right after high school. If entry is to be delayed, it is only for a year. Far fewer 1990 sophomores state that they will wait more than a year before entering college. The desire to attend college right after high school is stronger for each subgroup, with the exception of Asians, American Indians, and sophomores in non-Catholic private schools. As with postsecondary education plans, Asian sophomores in 1980 had shown the tendency to set their sights on college immediately after high school. This same tendency is seen in the 1990 cohort. While the increase in the desire to attend college right away is greater among students in Catholic schools. 1990 Sophomores in the two highest test quartiles

were less likely to say they would not attend college, or that there were not sure about attending college, than their counterparts in 1980.

Members of the 1990 cohort are more likely to say they will attend a postsecondary institution right after high school, with no delays, with 60 percent of 1990 sophomores planning immediate entry, as contrasted to 49 percent of their counterparts from a decade before.

Of course, expectations do not automatically translate into reality. However, in tandem with the increase in expectations, other data show a trend toward increased direct entry into college, despite costs that have risen faster than the general inflation rate. For 1990 high school graduates "3 out of 5 were enrolled in college in October 1990--one in a 2-year college and two in a 4-year college" while for 1980 graduates, 49.3 percent were enrolled in college in October following graduation (The Condition of Education, 1992, p. 28.).

While school reform and economic factors such as growth of the wage gap between high school and college graduates provide a context for such trends, we cannot investigate all of the possible determinants of this apparent zeal on the part of the 1990 sophomore cohort for attending college, nor the way in which these factors may interact. However, we do have the ability to investigate whether the advice given to 1990 sophomores by their parents and teachers regarding college is different from that given to the 1980 cohort. The data in Table 6.3 show the extent to which sophomores are advised to attend college by their fathers, mothers, counselors, and teachers. The picture that emerges is that these four important sources of influence were more likely to recommend college to the 1990 sophomores than was the case in 1980. Though this pattern emerges in the American Indian data, the differences do not reach statistical significance, with the exception of the postsecondary recommendations of teachers. The remarkable thing about this pattern is that it is consistent for nearly every other category reported in Table 6.3. The two exceptions concern parental press toward college for Asian students and students in non-Catholic private institutions. For these students, the shift is in the direction of being more likely to recommend college; however, the difference is not significant. In addition to the fact that these groups are small in number in the sample, they also exhibit the highest levels of press toward college in the 1980 cohort.

Table 6.1. Percentages of 1980 and 1990 sophomores aspiring to various levels of post-secondary education, by student characteristics.

Student Characteristics	High school diploma or less		Two years or less of college or vocational school		College graduate		Postgraduate degree	
	1980	1990	1980	1990	1980	1990	1980	1990
All Sophomores	26.5	10.2	32.9	30.3	22.7	32.1	17.9	27.4
Male	28.0	11.0	31.7	32.3	22.4	32.9	18.0	23.8
Female	23.4	9.4	34.2	28.3	23.8	31.4	18.7	30.9
Asian	11.7	8.2	21.5	21.7	32.4	31.4	34.3	38.7
Hispanic	33.7	14.3	33.7	38.5	17.0	25.5	15.6	21.7
Black	26.3	11.1	32.7	30.2	21.8	28.2	19.2	30.5
White	25.9	9.4	33.1	29.5	23.4	33.9	17.7	27.3
American Indian	35.7	18.8	32.9	43.0	17.2	21.8	14.2	16.5
Low SES	45.1	21.4	32.8	42.1	12.9	21.6	9.1	15.0
Middle SES	25.5	8.4	38.0	32.7	22.1	34.1	14.5	24.7
High SES	7.4	1.5	23.3	11.9	34.6	39.1	35.7	47.5
Northeast	25.0	9.3	30.3	24.9	24.1	35.5	20.6	30.3
North Central	28.6	10.4	32.4	31.3	22.4	32.3	16.6	25.9
South	28.3	10.6	33.9	30.2	21.7	32.1	16.0	27.1
West	21.8	9.9	34.8	33.8	23.3	29.1	20.1	27.2
Public	28.1	10.9	33.5	32.1	21.6	31.4	16.7	25.6
Catholic	9.8	3.2	27.1	12.2	33.2	42.1	29.9	42.5
Other Private	12.3	4.1	27.1	13.1	32.3	35.1	28.4	47.6
Test Quartile								
Lowest	47.5	21.4	33.1	46.3	11.8	19.8	7.6	12.5
Second	32.3	11.8	40.5	40.7	16.7	30.5	10.5	17.0
Third	18.5	5.4	37.8	26.3	26.5	38.6	17.2	29.7
Highest	7.0	1.7	21.2	10.6	35.6	38.6	36.2	49.1

Note: Owing to rounding, percentages may not sum to 100.

Sources: HS&B base year student survey (1980) and NELS:88 first follow-up student survey (1990), National Center for Education Statistics, US Department of Education

Table 6.2. Percentages of 1980 and 1990 sophomores who plan to go to college after graduating from high school, by student characteristics.

Student Characteristics	Right after High School		After a year		After more than a year		No/don't know	
	1980	1990	1980	1990	1980	1990	1980	1990
All Sophomores	48.5	60.3	15.8	17.1	21.2	9.3	14.3	13.2
Male	45.1	55.8	16.4	18.4	21.3	9.8	17.3	16.0
Female	51.7	64.6	15.4	15.9	20.9	9.1	11.9	10.4
Asian	73.2	78.2	13.3	10.1	11.5	4.6	2.0	7.1
Hispanic	43.8	52.7	18.3	22.9	25.1	12.9	12.8	11.5
Black	51.5	62.2	17.9	15.5	21.0	10.0	9.6	12.3
White	48.4	60.3	15.2	17.0	20.8	9.1	15.6	13.7
American Indian	33.0	45.4	22.5	17.5	30.1	15.3	14.5	21.7
Low SES	31.1	40.3	15.1	20.1	29.3	14.1	24.5	25.6
Middle SES	45.8	60.2	17.1	18.2	22.5	9.4	14.6	12.2
High SES	71.9	82.0	14.1	11.1	9.7	4.8	4.4	2.2
Northeast	52.2	66.9	13.9	13.6	18.7	8.3	15.2	11.2
North Central	47.4	59.6	16.0	16.1	21.4	9.8	15.2	14.6
South	46.2	59.7	14.7	17.0	23.0	9.6	16.1	13.8
West	50.0	56.6	20.3	21.6	20.3	10.0	9.3	11.9
Public	46.3	58.2	16.3	17.8	22.0	9.8	15.4	14.2
Catholic	71.1	83.0	10.8	9.2	13.0	4.7	5.1	3.1
Other Private	65.1	75.1	13.6	13.4	14.0	6.6	7.3	4.9
Test Quartile								
Lowest	29.9	39.4	16.8	20.2	28.7	13.4	24.6	27.0
Second	36.2	51.6	17.7	20.8	26.7	11.5	19.3	16.1
Third	51.6	66.8	16.5	15.8	19.9	9.1	12.0	8.2
Highest	73.1	82.0	12.4	11.2	10.2	4.5	4.3	2.3

Note: Owing to rounding, percentages may not sum to 100.

Sources: HS&B base year student survey (1980) and NELS:88 first follow-up student survey (1990), National Center for Education Statistics, US Department of Education

1990 sophomores reported receiving significantly more adult advice that urged them to attend college after high school than did 1980 sophomores:

- ***77 percent of 1990 sophomores reported that their fathers recommended they go to college; 59 percent of 1980 sophomores reported this recommendation***
- ***83 percent of 1990 sophomores indicated that their mothers recommended they go to college; the figure in 1980 was 65 percent***
- ***65 percent of 1990 sophomores reported that their guidance counselor urged them to attend college after high school, as contrasted to 32 percent for 1980 sophomores***
- ***66 percent of 1990 sophomores reported that their teachers recommended they attend college, compared to 32 percent for 1980 sophomores***

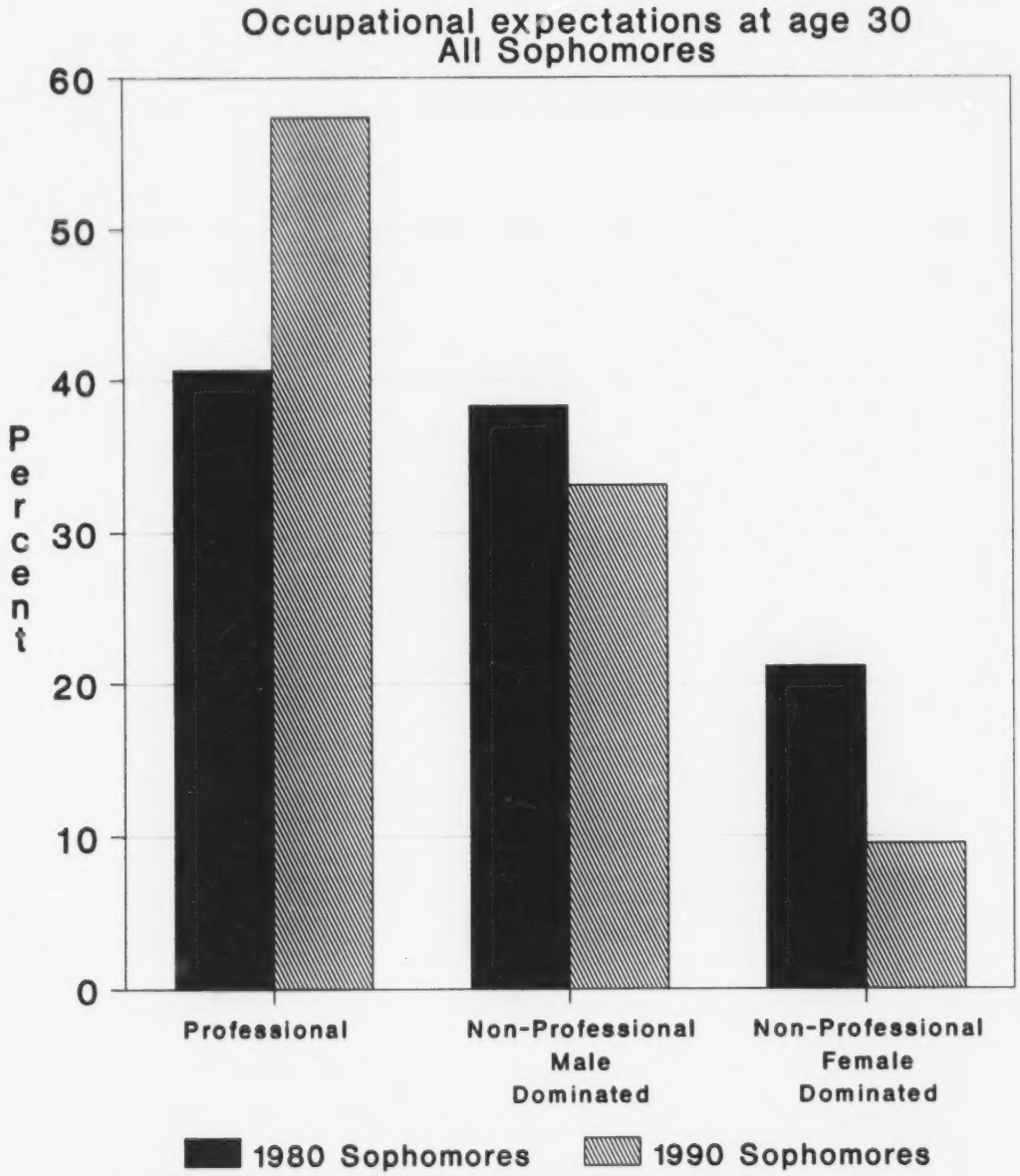
Next we compare occupational expectations across cohorts. Figures 6.1, 6.2, and 6.3 show changes in sophomore responses to occupational expectations at age 30. Both male and female sophomores in the 1990 cohort are more likely to expect to be in professional occupations at age 30. Preferences of male and female sophomores for traditionally male and female dominated non-professional occupations indicates some blurring of traditional gender-based choices similar to the pattern seen for vocational program participation. Male 1990 sophomores are less likely to expect to be in male-dominated occupations and female 1990 sophomores are less likely to expect to be in female-dominated occupations. There is a small but statistically significant tendency for 1990 female sophomores to express preference for male-dominated non-professional occupations when compared to their 1980 peers. Table 6.4 shows occupational expectations for the gender groups in detail. Of the traditionally male-dominated non-professional occupations female 1990 sophomores are more likely to aspire toward being managers and proprietors and less likely to aspire to technical careers than female 1980 sophomores.

Table 6.3. 1980 and 1990 sophomores' reports of percentages of fathers, mothers, guidance counselors, and teachers who recommend attending college after high school, by student characteristics.

Student Characteristics	Father		Mother		Guidance Counselor		Teachers	
	1980	1990	1980	1990	1980	1990	1980	1990
All Sophomores	59.1	77.0	64.8	82.9	32.3	65.2	32.3	65.5
Male	55.6	74.0	61.6	80.7	32.2	64.0	32.1	64.2
Female	63.5	80.0	68.6	85.2	32.7	66.3	32.5	66.8
Asian	78.7	87.9	81.1	88.8	32.9	68.6	34.6	72.0
Hispanic	56.3	75.3	63.2	81.1	32.2	64.8	34.5	65.2
Black	56.6	69.4	67.2	76.6	37.1	66.1	42.0	70.0
White	59.7	78.2	64.5	84.3	31.4	65.1	30.4	64.6
American Indian	46.8	62.4	51.9	70.3	31.7	52.4	29.6	59.9
Low SES	36.7	58.0	47.0	66.5	24.9	56.1	26.3	59.0
Middle SES	57.4	76.6	63.9	84.2	30.1	63.6	30.1	63.8
High SES	84.5	94.5	86.2	96.7	44.5	77.7	42.7	76.1
Northeast	62.4	82.6	67.0	88.0	37.5	72.9	32.4	68.2
North Central	55.9	74.9	63.3	82.3	29.9	64.4	35.2	62.3
South	56.2	75.9	62.4	81.3	30.0	64.1	30.1	67.4
West	65.3	76.3	69.0	82.0	32.9	61.6	33.4	63.4
Public	57.1	75.2	63.1	81.5	31.3	63.5	31.5	64.0
Catholic	78.1	92.9	82.5	95.4	40.6	80.8	37.1	77.6
Other private	77.1	91.2	78.8	94.4	45.5	80.5	45.1	79.3
Test Quartile								
Lowest	40.4	59.9	47.6	64.7	26.1	56.4	28.2	57.2
Second	49.7	71.7	55.6	79.3	26.1	61.1	26.5	60.7
Third	63.9	83.1	69.2	89.7	31.3	66.4	30.1	65.5
Highest	79.8	90.6	85.1	95.9	43.1	74.3	41.7	75.3

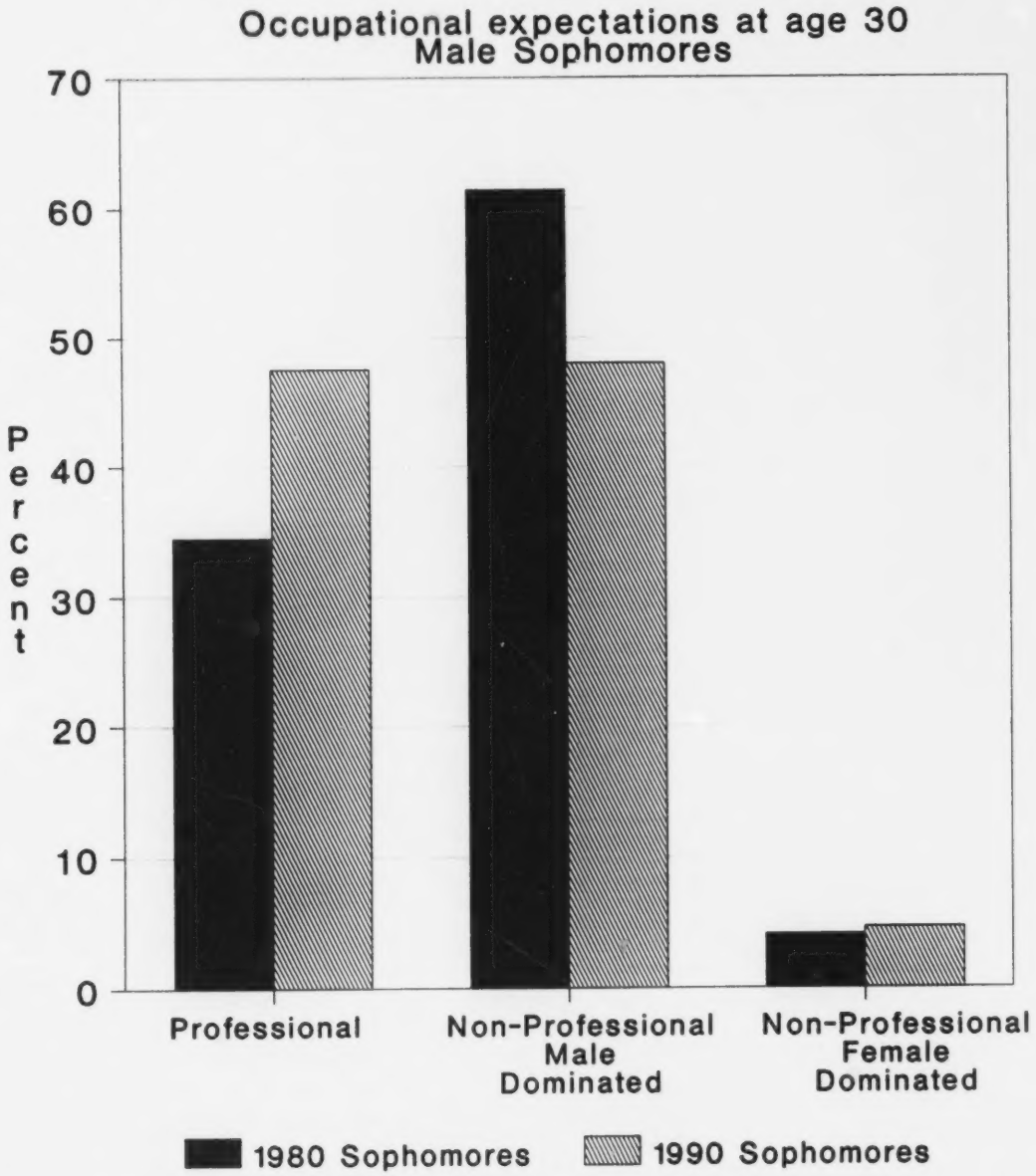
Sources: HS&B base year student survey (1980) and NELS:88 first follow-up student survey (1990), National Center for Education Statistics, US Department of Education

Figure 6.1. Comparison of occupational expectations, all sophomores



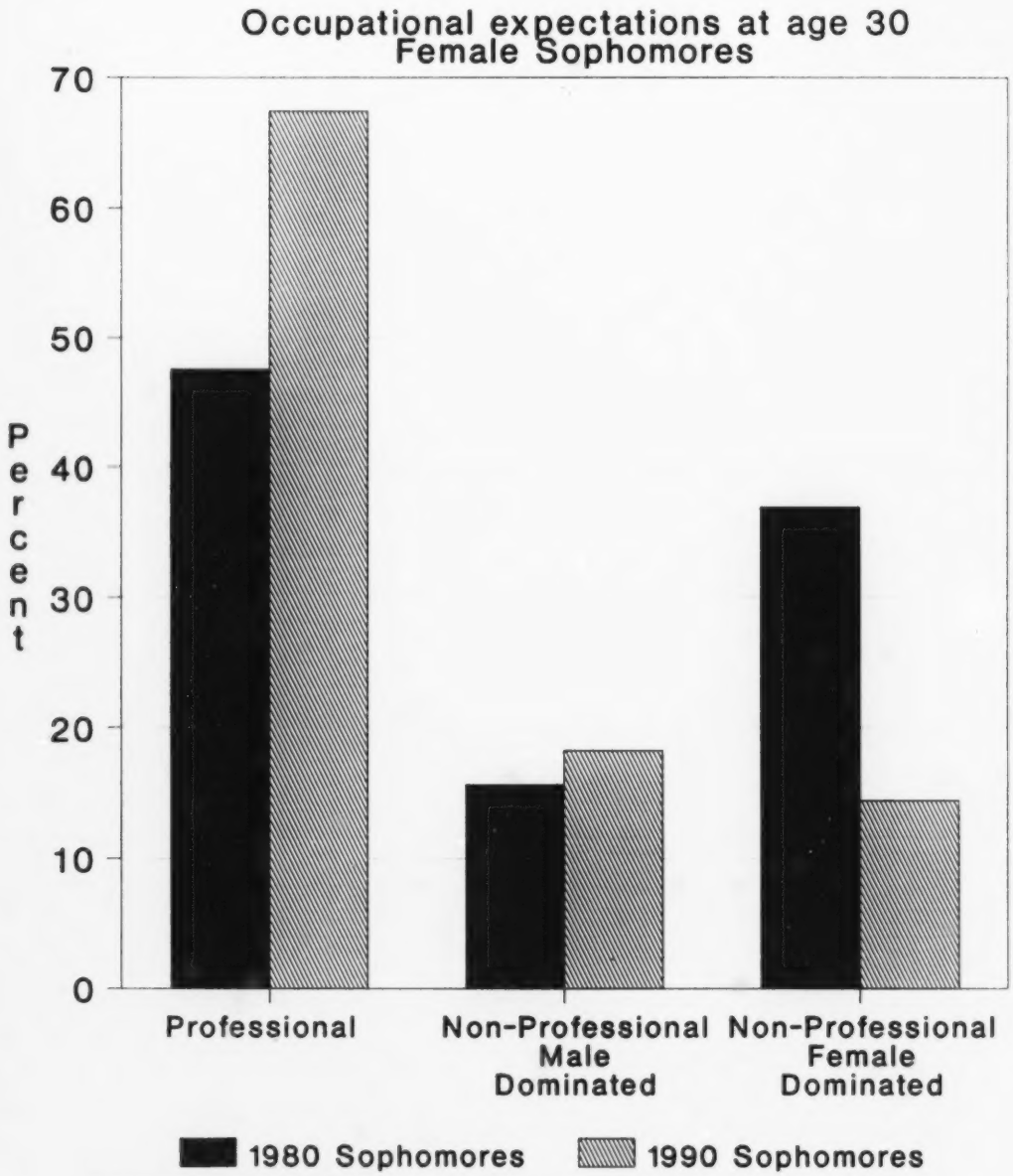
SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

Figure 6.2. Comparison of occupational expectations, male sophomores



SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

Figure 6.3-Comparison of occupational expectations, female sophomores



SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

Table 6.4. Percentages of 1980 and 1990 sophomores expecting to be in various occupation categories at age 30, by gender.

Occupational category	All Students		Males		Females	
	1980	1990	1980	1990	1980	1990
Total Professional	40.6	57.4	34.5	47.5	47.5	67.4
MALE-DOMINATED NON-PROFESSIONAL OCCUPATIONS						
Craftsman	9.7	4.3	18.3	7.9	1.0	0.7
Farmer	2.7	1.1	4.4	1.9	1.0	0.3
Laborer	2.3	0.7	4.1	1.2	0.4	0.3
Manager	4.1	6.3	4.9	6.7	3.3	5.9
Military	3.7	3.3	5.8	5.1	1.5	1.5
Operative	3.1	1.5	5.2	2.3	0.9	0.6
Proprietor	3.7	6.6	5.6	8.4	1.9	4.9
Protective Service	1.7	3.4	2.6	5.5	0.8	1.3
Technical	7.5	5.9	10.6	8.9	4.8	2.9
Subtotal	38.3	33.1	61.4	48.0	15.6	18.2
FEMALE-DOMINATED NON-PROFESSIONAL OCCUPATIONS						
Clerical	9.9	3.3	1.5	1.5	17.7	5.1
Homemaker	5.0	2.3	0.2	0.2	9.6	4.4
Sales	1.9	2.2	1.7	2.3	2.1	2.1
Service	4.2	1.7	0.6	0.5	7.5	2.8
Subtotal	21.1	9.5	4.1	4.6	36.9	14.4

Sources: HS&B base year student survey (1980) and NELS:88 first follow-up student survey (1990), National Center for Education Statistics, US Department of Education

CHAPTER 7: CONCLUSIONS

A Decade's Trends in the Light of the Goals of Educational Excellence and Equity

As a coda to this report, it may be fitting to briefly review findings that exemplify broader themes suggested by our analytic results. When educational outcomes for the NLS-72 cohort--the senior class of 1972--were compared to 1980 and 1982 results for the two HS&B cohorts, they provided one more item of evidence of a serious decline in educational performance in American secondary schools. It is therefore appropriate to ask whether there is any evidence that American sophomores were being better educated in 1990 than in 1980, and to ask as well whether there is any evidence that learning opportunities were more equally and equitably distributed by the decade's end. Only the mathematics tests for NELS:88 and HS&B permit us to directly address the question of whether any of the performance declines of the 1970s were halted or reversed in the 1980s. Nevertheless, questionnaire data from the two studies permit us to contrast important differences in the educational context of the two cohorts--for example, differences in students' reports of their high school programs--as well as to discern differences in student expectations, and the urgings conveyed to sophomores by their families and schools about the desirability of pursuing higher education. When these comparisons are supplemented by what is known from other data sources, an overall picture of some of the decade's important educational trends emerges.

We saw that between 1980 and 1990, there were changes in student demographics, with a decline in the number of sophomores and an increase in their cultural and racial diversity. There were changes in family composition and structure, with declining numbers of two-parent families, and a continuation of the trend toward increased labor force participation of mothers of infants, children and adolescents. Many of the most pronounced sociodemographic trends--for example, increasing numbers of children living in poverty, increasing numbers of students coming to school from non-English language backgrounds--might be thought to make the job of schools yet more difficult. On the other hand, America embarked on major school reforms in the 1980s with the intent of realizing more effective education for all. In the marketplace, the monetary worth of a high school education or less declined, while the return on a college education increased, thus widening an already considerable gap. Against this background of social changes and programmatic policy initiatives, differences between America's sophomores in 1980 and 1990--in expectations and values, in behaviors, and in achievement--may be analyzed.

Changes in schooling in the 1980s supply a dramatic backdrop for examining cross-time change in sophomores. In the first half of the decade, most states raised graduation requirements, most schools set stricter attendance standards, and increased standardized testing of students--and of teachers--answered calls for precise measurement of results and stricter accountability. Later in the 1980s reform took a different turn, stressing changes in instructional emphases and techniques, while acknowledging the movement toward grassroots empowerment--initiatives aimed at increasing the influence and active roles of parents and teachers. Reforms were diverse in intent and content; not all students were exposed to the same reform measures, nor exposed in equal measure. While it is difficult to say how pervasively the impetus for change was felt by the NELS:88 cohort--and while this report gives no basis for inferring the causes of the changes that it reports--the fact of the reform movement is a background factor that must be noted in any systematic comparison of the two sophomore cohorts. By and large, the HS&B 1980 sophomores were products of an era in American education when achievement levels were falling, while the 1990 sophomores are the first cohort potentially to have been stamped by the efforts toward educational improvement that arose in the aftermath of the 1970s declines in SAT scores and NAEP results, and the disappointing showing of American students on international math and science assessments.

Reformers of all persuasions have affirmed both excellence and equity, though they have differed in which they have emphasized, while hoping that the two goals could be harmonized. It is therefore fitting that these dual considerations--educational production, in its aspect of high achievement, and educational distribution, in its aspect of equalizing opportunity or educational access (certified by equality of outcomes for all relevant population subgroups)--be used to assess the importance of the differences we have observed between America's 1980 and 1990 sophomores. Below, therefore, we will take four examples of findings of this report and view them in the light of two questions: what changed?; and for whom did it change? More specifically, is there any evidence that sophomores in 1990 had a more positive orientation toward learning than did 1980 sophomores, and is there any evidence that they are learning more? And if there are gains in learning, are traditionally disadvantaged subgroups gaining too, and gaining at a rate that reduces historical disparities? The four examples that we shall review are program placement, mathematics achievement, student expectations to go on to college, and parental and school press for college-going.

The topic of **program placement**--the percentage of sophomores in a general, college preparatory, or vocational curriculum--exemplifies one important aspect of the in-school experience of sophomores. Program enrollment is of interest because the 1970s saw a shift away from enrollment in the academic curriculum, and toward general and vocational programs; this shift is one of the factors sometimes associated with declines on key achievement indicators. NELS:88 data (based on sophomores' self-reports) show a move away from the vocational curriculum and increased enrollment in the academic curriculum in the 1980s. As depicted in Table 2.2 of Chapter Two, substantially increased college preparatory program enrollments (and a decline in vocational enrollment) were registered for all socioeconomic status groups. By 1990, black sophomores were nearly as likely as white sophomores to be enrolled in college preparatory programs (41% versus 42%), and Hispanic enrollment in this program type had gone from 25 percent in 1980 to 35 percent in 1990.

Mathematics achievement. Achievement test scores declined over the course of the 1970s; a major goal of the reform movement was to reverse this trend. Comparison of HS&B and NELS:88 data demonstrates that America's sophomores gained in mathematics achievement between 1980 and 1990. Moreover, all socioeconomic status groups made significant gains. In terms of racial or ethnic groups, while white and Asian students continued to show higher levels of math achievement, black and Hispanic students showed proportionately greater gains, thus reducing some part of this long-standing gap. Traditionally gender has marked--starting late in high school--another gap in math achievement, as males forge ahead of females (Mullis, Owen, & Phillips, 1990, p.49). However, 1990 male and female sophomores were not significantly different in their math achievement, nor were differential gains observed by gender group when 1990 results were compared to 1980 data from HS&B. (Comparison of forthcoming results from NELS:88 1992 seniors, with the HS&B and NLS-72 seniors, will provide a fuller picture of whether a substantial gender gap in math achievement still exists.)

Changes in Student Postsecondary Expectations. While expectations and aspirations may not always be realized, they serve as good indicators of the academic ambitions of high school sophomores, pointing to educational goals that they apparently value and feel they have a realistic possibility of achieving. Postsecondary expectations increased over the decade: 1990 sophomores were significantly more likely to say they will go on to complete a bachelor's or advanced degree than were 1980 sophomores (59% versus 41%). Postsecondary expectations of blacks, Hispanics and individuals in the lowest socioeconomic status group show large increases. Moreover, increasing expectations are matched by increasing college enrollment. Current Population Survey data show that the percentage of high school graduates who enrolled in college in October following graduation increased from 49 percent to 60 percent between 1980 and 1990.

Home and School Press for Postsecondary Entry. The expectations of adults, especially of parents, but also of teachers and other school personnel, are widely thought to be critical determinants of students' motivation to learn, to persist in schooling, and to go on to postsecondary education. Sophomores in 1990 reported receiving significantly more adult encouragement to attend college after high school than did 1980 sophomores. The four sources of adult influence were fathers, mothers, counselors and teachers, and consistently all four groups were more likely to urge college attendance. This pattern holds for all socioeconomic status groups, and for blacks and Hispanics as well as for whites.

Other examples could have been chosen from this report, but the general conclusion would be unchanged. That general conclusion is that there are signs that some academic progress was achieved in the 1980s, and that the movement toward increased excellence was accompanied by some gains in equity as well. The achievement indicators provided by assessments such as NAEP; the dropout and school return and completion rates registered by HS&B, the Current Population Survey, and the 1980 and 1990 decennial censuses; the indications of higher academic course enrollment late in the 1980s that can be seen in comparison of the high school transcripts collected by HS&B and NAEP; and the comparisons of HS&B and NELS:88 sophomores reported here, provide convergent data supporting the conclusion that there were modest but significant gains in overall student achievement and other positive educational outcomes--and that gains were posted in educational equity as well.

These positive educational trends do not, of course, license complacency. Yet better--far better--results could be achieved, and should be. Modest gains may not be enough to prepare American students for increasingly demanding roles in the labor force, nor enough to maintain America's competitive edge in the global economy. As commentary on NAEP results has often pointed out, test gains in areas such as mathematics have tended to show improvements in basic computational skills but rather less progress in achieving problem solving skills. And while black and Hispanic results show a narrowing of the achievement gap between these minorities and the white majority, large disparities persist. Despite overall improvements, and gains in equity, NAEP and NELS:88 test data suggest that overall performance is low, measured both in historical terms and by the criterion of emerging standards.

While comparisons of questionnaire and test data of 1980 sophomores with those of 1990 supply no basis for complacency, such comparisons do supply the hope that continued vigorous efforts to achieve school improvement can succeed. Investigation of the dynamics and effects of educational processes--of the reasons why changes have occurred or failed to occur--is beyond the scope of this descriptive report. Nonetheless, longitudinal studies such as HS&B and NELS:88 provide critical data for such deeper investigations--investigations that may increase our understanding of how better to achieve school improvement, and to make higher quality and more effective learning available to all.

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APPENDIX A: Unweighted Sample Sizes, Standard Errors and Chapter 3 Supplementary Statistics

Table A1. Unweighted sample sizes for subgroups formed by classification variables.

Student Characteristics	Unweighted Sample Sizes	
	1980	1990
Male	13382	8745
Female	14511	8799
Asian	405	1162
Hispanic	3788	2138
Black	4194	1718
White	21071	12243
American Indian	297	193
Low SES	7540	4229
Middle SES	14007	7995
High SES	7090	4786
Northeast	6248	3313
North Central	6253	4605
South	12001	6040
West	5528	3541
Public	26241	15059
Catholic	2808	982
Other Private	981	1461
Test Quartile		
Lowest	7048	3474
Second	6875	4067
Third	6641	4228
Highest	6971	4878

SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

Table A1.1 Standard errors for percentages of 1980 and 1990 sophomores in each racial/ethnic category

Race/Ethnicity	1980	1990
Asian	0.13	0.29
Hispanic	0.38	0.79
Black	0.82	0.81
White	0.95	1.16
American Indian	0.15	0.22

SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

Table A1.2 Standard errors for percentages of 1980 and 1990 sophomores in each socioeconomic category, by race/ethnicity

Race/Ethnicity	Low SES		Middle SES		High SES	
	1980	1990	1980	1990	1980	1990
Asian	2.99	1.78	2.93	2.55	3.12	2.44
Hispanic	1.49	2.07	1.20	1.79	0.85	1.08
Black	1.42	2.37	1.24	2.16	0.79	1.15
White	0.53	0.69	0.59	0.81	0.80	0.99
American Indian	3.56	5.68	3.45	5.29	2.18	2.47

SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

Table A1.3 Standard errors for percentages of 1980 and 1990 sophomores in each sector, by race/ethnicity

Race/Ethnicity	Public		Catholic		Other Private	
	1980	1990	1980	1990	1980	1990
Asian	1.95	3.26	1.54	1.83	1.14	2.98
Hispanic	1.46	1.54	1.02	1.17	1.09	0.77
Black	0.57	1.46	0.53	1.44	0.02	0.37
White	1.31	0.80	0.97	0.59	0.95	0.48
American Indian	1.25	1.01	0.54	1.01	1.09	0.05

SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

Table A1.4 Standard errors for percentages of 1980 and 1990 sophomores in each sector, by SES

Socioeconomic Status	Public		Catholic		Other Private	
	1980	1990	1980	1990	1980	1990
Low SES	0.53	0.42	0.48	0.37	0.21	0.19
Middle SES	1.12	0.71	0.84	0.58	0.78	0.42
High SES	2.20	1.65	1.61	1.11	1.78	1.17

SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

Table A2.1 Standard errors for percentages of 1980 and 1990 sophomores in each high school program, by gender

High School Program	All Students		Males		Females	
	1980	1990	1980	1990	1980	1990
General	0.71	0.95	0.82	1.20	0.91	1.14
College Prep.	0.74	0.96	0.87	1.25	0.90	1.13
Vocational						
Agricultural	0.15	0.11	0.27	0.20	0.13	0.07
Business or office	0.26	0.26	0.20	0.30	0.43	0.38
Distributive	0.10	0.08	0.13	0.15	0.13	0.09
Health	0.09	0.10	0.10	0.09	0.13	0.18
Home economics	0.12	0.09	0.08	0.14	0.20	0.10
Technical occupations	0.13	0.13	0.21	0.25	0.10	0.05
Trade or industrial	0.31	0.10	0.54	0.19	0.15	0.08

SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

Table A2.2 Standard errors for percentages of 1980 and 1990 sophomores in General, College Prep., and vocational high school programs, by sector, race, SES, and test quartile

Student Characteristics	General		College Prep.		Vocational	
	1980	1990	1980	1990	1980	1990
All Sophomores	0.71	0.95	0.74	0.96	0.61	0.37
Asian	2.98	2.62	3.19	2.93	2.18	1.63
Hispanic	1.41	2.10	1.27	1.97	1.34	1.14
Black	1.48	2.67	1.59	2.78	1.48	1.54
White	0.79	1.13	0.82	1.14	0.59	0.38
American Indian	3.78	5.27	2.89	4.65	4.17	4.18
Low SES	1.02	1.52	0.74	1.38	0.90	1.00
Middle SES	0.81	1.15	0.73	1.17	0.68	0.49
High SES	1.07	1.77	1.19	1.78	0.47	0.26
Northeast	1.41	2.32	1.69	2.47	1.56	0.96
Northcentral	1.56	1.66	1.65	1.68	1.32	0.53
South	1.05	1.49	1.02	1.49	0.91	0.71
West	1.47	2.21	1.58	2.16	0.93	0.79
Public	0.70	0.96	0.64	0.96	0.64	0.42
Catholic	3.30	3.97	3.49	3.98	0.84	0.61
Other Private	5.98	5.11	7.51	5.15	2.69	0.27
Test Quartile						
Lowest	1.09	1.96	0.58	1.98	0.97	1.31
Second	1.02	1.44	0.81	1.37	0.91	0.75
Third	1.03	1.52	1.01	1.57	0.65	0.55
Highest	1.01	1.42	1.10	1.43	0.45	0.32

SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

Table A2.3 Standard errors for percentages of 1980 and 1990 sophomores saying they usually or often come to school without paper and pencil, books, and/or homework, by student characteristics

Student Characteristics	Come to school without books		Come to school without paper, pen or pencil		Come to school without homework	
	1980	1990	1980	1990	1980	1990
All Sophomores	0.24	0.30	0.28	0.38	0.32	0.33
Male	0.38	0.41	0.43	0.65	0.50	0.45
Female	0.26	0.38	0.32	0.34	0.39	0.45
Asian	2.69	1.48	2.09	1.40	2.42	1.44
Hispanic	0.84	1.08	0.91	1.10	0.97	1.05
Black	0.78	0.87	0.81	0.96	0.87	1.30
White	0.23	0.32	0.30	0.47	0.34	0.34
American Indian	2.60	3.25	2.70	2.64	2.64	2.36
Low SES	0.45	0.69	0.55	0.63	0.62	0.90
Middle SES	0.30	0.42	0.36	0.47	0.41	0.69
High SES	0.33	0.34	0.48	1.02	0.55	1.05
Public	0.25	0.32	0.30	0.35	0.33	0.48
Catholic	0.56	0.82	1.05	1.60	1.06	1.61
Other Private	1.09	1.40	1.25	5.13	2.35	4.52
Test Quartile						
Lowest	0.55	0.80	0.64	0.82	0.68	0.80
Second	0.40	0.55	0.52	0.65	0.59	0.73
Third	0.32	0.42	0.48	0.59	0.57	0.52
Highest	0.25	0.30	0.44	0.86	0.50	0.39

SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

Table A2.4. Standard errors for percentages of 1980 and 1990 sophomores who report that they do not feel safe at their school by student characteristics.

Student Characteristics	1980	1990
All Sophomores	0.30	0.33
Male	0.41	0.45
Female	0.38	0.45
Asian	2.21	1.44
Hispanic	0.85	1.05
Black	0.95	1.30
White	0.29	0.34
American Indian	1.98	2.36
Low SES	0.56	0.81
Middle SES	0.38	0.41
High SES	0.41	0.56
Public	0.32	0.37
Catholic	0.68	0.89
Other private	1.71	0.66
Test Quartile		
Lowest	0.63	0.80
Second	0.52	0.73
Third	0.45	0.52
Highest	0.35	0.39

SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

Table A2.5. Percentages of 1980 and 1990 sophomores in different test quartiles by racial/ethnic group

Race/Ethnicity	Lowest test quartile		Second test quartile		Third test quartile		Highest test quartile	
	1980	1990	1980	1990	1980	1990	1980	1990
Asian	2.43	2.10	3.17	1.98	2.80	2.35	3.24	2.72
Hispanic	1.50	1.69	1.08	1.73	0.90	1.38	0.77	1.10
Black	1.56	2.40	0.93	1.97	0.83	2.15	0.67	1.07
White	0.43	0.62	0.41	0.61	0.36	0.58	0.59	0.77
American Indian	5.16	6.57	3.47	5.10	2.65	3.42	1.97	2.91

SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

Table A3.1 R-squares from combinations of predictors

	YEAR	GROUP	YR+GRP	YR+GRP+1	RSQ GAIN (Interaction)	F (Interaction)	PROB
Sex	0.0160	0.0002	0.0162	0.0162	0.0000	1.0915	0.2958
Race	0.0168	0.1129	0.1271	0.1283	0.0012	18.8712	0.0000
SES Q	0.0142	0.1503	0.1618	0.1621	0.0003	4.8781	0.0022
Region	0.0164	0.0278	0.0456	0.0461	0.0005	8.0174	0.0000
Curric	0.0282	0.1676	0.1838	0.1854	0.0016	37.3374	0.0000
Sector	0.0162	0.0120	0.0284	0.0284	0.0000	1.4368	0.2306

SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

NOTE: Table A3.1 presents a summary of the statistical tests used to determine if certain subpopulations gained significantly more than others. Four equations are tested in each row of the table. The statistics in each of the first four columns are R-squares from each of the equations. In the first column, the coefficients are R-squares from an equation with an intercept term and a dummy variable representing YEAR (1980 vs 1990). In the second column, the coefficients are R-squares from an equation with an intercept term and a dummy variable or variables representing GROUP membership (e.g., males vs females, Hispanics vs whites, etc.). The third column has R-squares for equations with YEAR and GROUP both included. The fourth column gives R-squares for equations with YEAR, GROUP, and the YEAR by GROUP interaction (I). Column 5 presents the improvement in R-squared when the YEAR by GROUP interaction is included in the equation as opposed to when YEAR and GROUP are included only as main effects. Columns 6 and 7 give statistical tests of the improvement in R-Squared. Entries in the "RSQ GAIN", "F", and "PROB" columns provide evidence for or against differential subpopulation gains. Given the sample design effect, the only gains across years are for race and curriculum groups.

Table A3.2 Statistical tests of group means (including effect sizes)

	HSB 80			NELS 90					EFFECT
	N	MEAN	SD	N	MEAN	SD	t	p	SIZE
Total	24,685	32.81	12.29	17,281	35.97	12.22	-26.00	0.00	0.26
Male	12,031	33.02	12.79	8,655	36.06	12.50	-16.99	0.00	0.25
Female	12,654	32.60	11.77	8,626	35.89	11.92	-19.89	0.00	0.27
Hispanic	4,180	25.96	10.28	2,076	30.75	11.13	-16.89	0.00	0.34
Asian	351	38.82	12.50	1,103	40.26	12.27	-1.90	0.00	0.12
Black	3,048	24.51	9.56	1,765	28.74	10.60	-14.21	0.00	0.35
White	16,754	35.41	11.91	12,047	37.96	11.84	-17.95	0.00	0.21
SES low	5,912	26.93	10.45	3,687	39.17	10.70	-10.10	0.00	0.18
SES 2	5,889	31.65	11.47	4,040	34.10	11.49	-10.42	0.00	0.20
SES 3	5,760	34.58	11.76	4,088	37.15	11.47	-10.83	0.00	0.21
SES high	6,115	39.53	11.66	4,987	42.90	10.74	-15.69	0.00	0.27
Northeast	5,242	34.86	12.53	3,213	38.51	11.81	-13.28	0.00	0.30
Northcent	7,269	34.52	12.20	4,576	37.35	11.97	-12.39	0.00	0.23
South	7,854	29.68	11.59	6,176	33.64	12.09	-19.72	0.00	0.32
West	4,320	33.69	12.27	3,285	36.21	12.34	-8.87	0.00	0.21
General	10,899	30.97	11.39	6,916	35.20	11.55	-24.06	0.00	0.35
Academ	8,556	39.80	11.25	6,068	42.35	10.39	-13.99	0.00	0.21
Voc Tec	4,744	26.65	10.68	1,594	28.28	10.84	-5.25	0.00	0.13
Public	21,490	32.22	12.26	14,926	35.45	12.24	-24.74	0.00	0.26
Catholic	2,479	38.11	10.66	954	40.72	10.14	-6.53	0.00	0.21

SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

NOTE: t-test based on design effect-corrected standard errors.

Table A4.1. Standard errors for percentages of 1980 and 1990 sophomores who participate in a variety of school-sponsored extra-curricular activities, by student characteristics.

Student Characteristics	Academic Clubs		Athletics		Cheerleading		Hobby Clubs		Music		Vocational Clubs	
	1980	1990	1980	1990	1980	1990	1980	1990	1980	1990	1980	1990
All Sophomores	0.42	0.62	0.45	0.69	0.35	0.43	0.34	0.37	0.43	0.59	0.54	0.54
Male	0.50	0.83	0.56	0.89	0.25	0.45	0.49	0.52	0.46	0.63	0.57	0.65
Female	0.55	0.87	0.59	0.89	0.59	0.68	0.42	0.50	0.63	0.85	0.66	0.69
Asian	2.87	2.24	2.72	2.86	1.64	0.98	2.67	1.47	2.79	2.76	1.33	0.81
Hispanic	1.11	1.57	1.29	1.82	0.76	0.86	1.01	0.67	1.04	1.19	0.85	0.87
Black	1.04	1.91	0.96	2.22	0.79	2.34	0.93	0.78	1.04	1.77	1.17	1.84
White	0.47	0.72	0.53	0.78	0.41	0.38	0.38	0.46	0.50	0.68	0.60	0.64
Am.Indian	2.90	4.66	3.11	5.05	1.99	3.06	2.66	2.83	3.23	3.66	2.94	3.30
Low SES	0.71	1.05	0.73	1.19	0.58	0.82	0.62	0.56	0.68	0.93	0.83	1.15
Middle SES	0.55	0.89	0.55	0.92	0.44	0.65	0.44	0.55	0.57	0.77	0.63	0.67
High SES	0.75	1.16	0.77	1.21	0.59	0.65	0.62	0.68	0.78	1.09	0.50	0.54
Northeast	0.78	1.35	1.10	1.49	0.61	0.66	0.76	1.21	0.90	1.33	0.58	0.46
Northcentral	0.79	1.27	0.96	1.27	0.80	0.63	0.68	0.53	0.92	1.22	1.14	1.17
South	0.73	1.06	0.66	1.16	0.58	0.96	0.49	0.53	0.68	0.93	1.07	1.10
West	0.93	1.32	1.03	1.59	0.80	0.71	0.89	0.78	1.00	1.30	0.87	0.86
Public	0.44	0.65	0.44	0.70	0.35	0.46	0.35	0.38	0.44	0.61	0.58	0.60
Catholic	1.63	2.40	1.91	2.76	1.55	1.18	1.27	1.53	1.62	1.60	0.50	0.64
Other Private	2.63	4.60	4.15	4.46	3.09	2.47	2.27	3.50	3.80	5.01	1.76	2.32
Test Quartile												
Lowest	0.73	1.21	0.76	1.42	0.56	0.95	0.64	0.59	0.73	0.87	0.86	1.19
Second	0.69	1.18	0.72	1.22	0.59	0.94	0.60	0.58	0.73	1.08	0.79	0.86
Third	0.66	1.15	0.76	1.22	0.55	0.82	0.62	0.65	0.74	1.05	0.67	0.90
Highest	0.79	1.17	0.79	1.25	0.56	0.72	0.59	0.75	0.78	1.05	0.53	0.60

SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

Table A4.2. Standard errors for percent of 1980 and 1990 sophomores who say they watch five hours or more of television on school nights, by student characteristics.

Student Characteristics	Watch 5 or more hours	Watch more than 5 hours
	1980	1990
All Sophomores	0.39	0.44
Male	0.55	0.72
Female	0.50	0.50
Asian	2.86	1.11
Hispanic	1.08	1.32
Black	0.94	2.30
White	0.43	0.35
Am.Indian	2.73	4.26
Low SES	0.72	0.82
Middle SES	0.50	0.70
High SES	0.61	0.35
Northeast	0.83	0.95
Northcentral	0.84	0.80
South	0.57	0.85
West	0.89	0.84
Public	0.41	0.48
Catholic	1.06	1.09
Other Private	3.01	0.80
Test quartile		
Lowest	0.74	1.21
Second	0.67	1.13
Third	0.62	0.49
Highest	0.58	0.38

SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

Table A4.3. Standard errors for percentages of 1980 and 1990 sophomores who say they engage in various activities at least once or twice a week, by student characteristics.

Student Characteristics	Just driving or riding around		Visiting with friends at a local hangout		Talking with friends on the telephone		Reading for pleasure	
	1980	1990	1980	1990	1980	1990	1980	1990
All Sophomores	0.49	0.66	0.38	0.65	0.40	0.55	0.42	0.64
Male	0.62	0.93	0.50	0.84	0.57	0.86	0.58	0.86
Female	0.58	0.88	0.54	0.90	0.43	0.63	0.55	0.89
Asian	3.02	2.74	3.10	2.31	2.74	1.85	2.93	2.35
Hispanic	1.23	1.69	1.05	2.26	1.20	1.54	1.27	1.80
Black	1.19	2.49	0.94	2.34	1.04	2.05	1.06	2.15
White	0.53	0.72	0.44	0.71	0.41	0.60	0.46	0.71
American Indian	3.07	5.46	2.76	3.41	5.25	8.48	3.39	6.39
Low SES	0.74	1.21	0.71	1.32	0.77	1.02	0.77	1.10
Middle SES	0.59	0.90	0.50	0.88	0.48	0.73	0.55	0.88
High SES	0.93	1.36	0.64	1.15	0.56	1.12	0.80	1.24
Northeast	1.07	1.31	0.87	1.37	0.92	1.22	1.03	1.24
Northcentral	0.96	1.23	0.80	1.25	0.76	0.90	0.80	1.24
South	0.71	1.17	0.63	1.06	0.61	1.04	0.63	1.15
West	0.98	1.46	0.82	1.67	1.00	1.21	1.05	1.34
Public	0.50	0.68	0.40	0.68	0.41	0.57	0.44	0.66
Catholic	1.81	2.73	1.73	2.03	1.48	2.15	1.55	2.80
Other Private	3.77	4.39	1.80	3.92	2.28	3.15	3.22	4.19
Test Quartile								
Lowest	0.82	1.37	0.70	1.41	0.74	1.33	0.83	1.17
Second	0.79	1.19	0.65	1.26	0.69	1.06	0.74	1.25
Third		0.81	1.25	0.67	1.15	0.65	0.85	0.761.17
Highest	0.82	1.18	0.72	1.16	0.61	1.05	0.77	1.15

SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

Table A5.1. Standard errors in perceptions and values of high school sophomores: 1980 and 1990

Variable	1980	1990
A. Self-esteem (percentage *agree strongly*)		
Feel good about myself	0.38	0.70
Person of worth, equal of others	0.33	0.60
Satisfied with self	0.20	0.27
I'm no good at all	0.14	0.20
Not much to be proud of	0.34	0.45
B. Locus of control (percentage *agree strongly* or *agree*)		
Good luck more important than hard work	0.42	0.62
Every time I try to get ahead, something stops me	0.38	0.53
My plans hardly ever work out	0.31	0.49
When I make plans, I can make them work	0.44	0.70
C. Social image (percentage responding *"others see me as [very] ..."*)		
Popular	0.30	0.43
Athletic	0.26	0.50
Socially active	0.32	0.53
A good student	0.38	0.60
Important	0.28	0.49
A trouble-maker	0.15	0.28
Part of the leading crowd	0.26	0.47
D. Life values (percentage believe *very important*)		
Work success	0.27	0.47
Marriage/family	0.28	0.56
Money	0.41	0.65
Friendship	0.35	0.55
Steady work	0.28	0.40
Giving my children better opportunities	0.42	0.56
Living close to parents/relatives	0.31	0.54
Leaving this area	0.31	0.51
Correcting inequalities	0.29	0.50
Having children	0.42	0.65
Leisure time	0.35	0.63

SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

Table A6.1. Standard errors for percentages of 1980 and 1990 sophomores expecting to achieve various levels of post secondary education by student characteristics.

Student Characteristics	High school diploma or less		Two years or less of college or vocational school		College graduate		Postgraduate degree	
	1980	1990	1980	1990	1980	1990	1980	1990
All sophomores	0.50	0.42	0.39	0.65	0.38	0.59	0.40	0.64
Male	0.66	0.52	0.54	0.88	0.52	0.84	0.54	0.87
Female	0.58	0.62	0.52	0.84	0.47	0.81	0.50	0.84
Asian	2.08	1.86	2.66	2.51	2.99	2.00	3.36	2.87
Hispanic	1.18	1.19	1.07	1.95	0.83	1.40	0.84	1.52
Black	1.06	1.13	0.89	2.02	0.83	1.87	0.91	2.05
White	0.57	0.48	0.45	0.72	0.44	0.67	0.46	0.73
Am.Indian	4.12	6.26	3.01	4.51	3.63	3.96	2.08	3.29
Low SES	0.82	1.17	0.67	1.21	0.50	0.95	0.43	0.98
Middle SES	0.52	0.46	0.52	0.91	0.45	0.81	0.39	0.75
High SES	0.40	0.23	0.68	0.75	0.68	1.20	0.80	1.30
Northeast	1.19	0.90	0.87	1.43	0.94	1.35	1.05	1.77
North Central	1.10	0.73	0.81	1.16	0.88	1.02	0.85	1.15
South	0.75	0.60	0.58	1.13	0.53	1.20	0.54	0.99
West	1.06	1.29	0.91	1.53	0.86	1.11	0.94	1.36
Public	0.50	0.46	0.38	0.67	0.37	0.62	0.37	0.62
Catholic	1.21	0.88	1.72	1.81	1.52	2.24	1.94	2.74
Other Private	2.63	1.41	3.77	2.73	3.06	3.50	4.29	4.48
Test Quartile								
Lowest	0.87	1.02	0.71	1.39	0.53	1.22	0.41	1.29
Second	0.76	0.68	0.70	1.23	0.56	1.00	0.49	0.90
Third	0.64	0.51	0.72	1.10	0.67	1.13	0.58	1.05
Highest	0.39	0.27	0.68	0.70	0.67	1.17	0.89	1.24

SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

Table A6.2. Standard errors for percentages of 1980 and 1990 sophomores who plan to go to college after graduating from high school, by student characteristics.

Student Characteristics	Right after High School		After a year		After more than a year		No/don't know	
	1980	1990	1980	1990	1980	1990	1980	1990
All Sophomores	0.62	0.70	0.32	0.47	0.35	0.35	0.39	0.50
Male	0.77	0.97	0.43	0.65	0.48	0.46	0.55	0.72
Female	0.72	0.91	0.41	0.63	0.44	0.52	0.41	0.63
Asian	3.22	2.36	2.26	1.40	1.99	0.79	0.73	1.92
Hispanic	1.34	1.82	0.95	1.53	1.11	1.17	0.86	1.02
Black	1.30	1.99	0.91	1.37	0.96	1.34	0.66	1.18
White	0.70	0.81	0.37	0.54	0.39	0.40	0.47	0.62
American Indian	3.33	5.82	3.45	3.72	3.22	2.96	2.72	7.41
Low SES	0.79	1.19	0.54	0.91	0.70	0.80	0.78	1.25
Middle SES	0.64	0.91	0.44	0.65	0.42	0.56	0.45	0.59
High SES	0.81	1.04	0.56	0.92	0.46	0.44	0.31	0.29
Northeast	1.63	1.63	0.66	0.92	0.83	0.70	1.04	1.15
Northcentral	1.25	1.27	0.64	0.76	0.70	0.57	0.81	0.89
South	0.87	1.18	0.49	0.78	0.53	0.68	0.55	0.82
West	1.32	1.60	0.74	1.17	0.83	0.87	0.69	1.32
Public	0.58	0.72	0.33	0.47	0.36	0.38	0.40	0.54
Catholic	1.91	1.91	1.04	1.35	1.28	1.02	0.80	0.83
Other Private	4.75	4.50	2.18	4.09	2.53	1.84	2.43	1.62
Test Quartile								
Lowest	0.87	1.54	0.62	1.09	0.70	0.84	0.81	1.20
Second	0.83	1.26	0.60	0.88	0.67	0.74	0.67	0.93
Third	0.85	1.17	0.60	0.82	0.62	0.83	0.54	0.68
Highest	0.76	0.82	0.53	0.68	0.45	0.43	0.33	0.29

SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

Table A6.3. Standard errors for 1980 and 1990 sophomores' reports of percentages of fathers, mothers, guidance counselors, and teachers of 1980 and 1990 sophomores who recommend attending college after high school, by student characteristics.

Student Characteristics	Father		Mother		Guidance Counselor		Teachers	
	1980	1990	1980	1990	1980	1990	1980	1990
All Sophomores	0.62	0.70	0.58	0.63	0.57	0.74	0.49	0.71
Male	0.80	0.97	0.76	0.86	0.69	0.99	0.64	1.00
Female	0.69	0.91	0.64	0.87	0.70	0.96	0.59	0.90
Asian	2.83	1.75	2.98	1.59	3.39	2.44	3.28	2.33
Hispanic	1.32	1.72	1.28	1.47	1.25	1.93	1.25	1.87
Black	1.31	2.37	1.29	2.42	1.05	2.43	1.17	2.49
White	0.70	0.79	0.66	0.67	0.65	0.84	0.53	0.78
American Indian	3.23	7.11	3.33	7.35	5.55	8.98	4.23	7.75
Low SES	0.85	1.58	0.90	1.61	0.75	1.46	0.81	1.47
Middle SES	0.64	0.88	0.65	0.80	0.63	0.99	0.55	0.98
High SES	0.59	0.54	0.53	0.36	0.97	1.07	0.83	1.05
Northeast	1.53	1.36	1.48	1.06	1.33	1.63	1.11	1.59
Northcentral	1.28	1.17	1.26	1.01	1.19	1.32	1.06	1.25
South	0.94	1.23	0.86	1.18	0.82	1.24	0.73	1.27
West	1.33	1.80	1.19	1.66	1.33	1.82	1.10	1.65
Public	0.62	0.74	0.57	0.68	0.56	0.77	0.49	0.73
Catholic	1.66	1.12	1.54	0.98	2.38	2.27	1.85	2.40
Other Private	4.65	2.05	5.23	1.63	6.12	2.94	4.39	3.00
Test Quartile								
Lowest	0.87	1.54	0.93	1.57	0.87	1.55	0.92	1.49
Second	0.85	1.40	0.87	1.32	0.72	1.42	0.74	1.46
Third	0.87	0.97	0.82	0.75	0.81	1.21	0.76	1.26
Highest	0.68	0.72	0.56	0.43	1.01	1.13	0.80	1.03

SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

Table A6.4. Standard errors for percentages of 1980 and 1990 sophomores expecting to be in various occupation categories at age 30, by gender.

Occupational category	All Students		Males		Females	
	1980	1990	1980	1990	1980	1990
TOTAL PROFESSIONAL	0.51	0.75	0.63	1.13	0.64	0.83
MALE DOMINATED OCCUPATIONS						
Craftsman	0.24	0.24	0.45	0.44	0.10	0.16
Farmer	0.15	0.11	0.29	0.21	0.10	0.07
Laborer	0.10	0.09	0.20	0.17	0.07	0.05
Manager	0.15	0.32	0.23	0.47	0.18	0.40
Military	0.15	0.23	0.27	0.41	0.13	0.19
Operative	0.13	0.29	0.24	0.55	0.09	0.17
Proprietor	0.14	0.43	0.24	0.60	0.15	0.53
Protective Service	0.09	0.24	0.17	0.43	0.09	0.19
Technical	0.19	0.30	0.33	0.54	0.22	0.27
FEMALE DOMINATED OCCUPATIONS						
Clerical	0.25	0.22	0.14	0.24	0.42	0.37
Homemaker	0.18	0.20	0.05	0.09	0.34	0.38
Sales	0.10	0.17	0.14	0.26	0.15	0.23
Service	0.15	0.13	0.09	0.10	0.28	0.23

SOURCES: High School and Beyond Base Year Survey, 1980 Sophomore Cohort and National Education Longitudinal Study of 1988, First Follow-up Student Survey, U.S. Department of Education, National Center for Education Statistics.

APPENDIX B: Methodological and Technical Notes

This appendix documents the HS&B and NELS:88 sample designs; assesses comparability of NELS:88 and HS&B estimates and the comparability of each to other data sources; and provides information about precision of estimates, statistical and analytical procedures, and the variables used in this report.

Additional information--about the aims and design of HS&B and NELS:88, data collection results, structure of the data files, specifications used in creating composite variables, universe coverage, sample selection procedures, weighting methodology, selected standard error estimates, estimates of design effects for broad categories of students, and results of nonresponse analyses--is provided in the various user's manuals and technical reports.[1] For detailed reliability and validity information concerning the HS&B and NELS:88 cognitive tests, the various psychometric and technical reports should be consulted.[2]

Sample Design

The HS&B Sample Design. The NCES national education longitudinal survey High School and Beyond was initiated in 1980. HS&B was intended to be a general, multipurpose study, serving diverse users and needs. Thus, while attempting to collect data comparable to the 1972 study, HS&B sought to increase the data's usefulness, accuracy and scope. While allowing for analyses of schools and students on a national level, the study also permitted separate analyses of specific types of schools and subclasses of students.

The sample design reflected these survey objectives. On one level, the design yielded a probability sample of approximately 36,000 sophomores and 36,000 seniors, and was keyed to providing national estimates. On another level, the sample was one in which certain policy-relevant subgroups (for

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[1]For HS&B, the relevant sources are:

Frankel, M.R., Kohnke, L., Buonanno, D., and Tourangeau, R. 1981. HS&B Base Year Sample Design Report. Chicago: NORC.

NORC. High School and Beyond Information for Users: Base Year (1980) Data. 1980. Chicago: Author.

For NELS:88, see:

Spencer, B.D., Frankel, M.R., Ingels, S.J., Rasinski, K.A., and Tourangeau, R. 1990. NELS:88 Base Year Sample Design Report, Washington, D.C.: National Center for Education Statistics (NCES 90-463).

Ingels, S.J., Scott, L.A., Lindmark, J.T., Frankel, M.R., and Myers, S.L. 1992. NELS:88 First Follow-Up: Student Component Data File User's Manual. Washington, D.C.: National Center for Education Statistics. (NCES 92-030).

[2]In particular, see:

Rock, D.A., Hilton, T.L., Pollack, J.M., Ekstrom, R.B., Goertz, M.E. 1985. Psychometric Analysis of the NLS and the High School and Beyond Test Batteries. Washington, D.C.: National Center for Education Statistics (NCES 85-218).

Rock, D.A., and Pollack, J.M. Psychometric Report for the NELS:88 Base Year Test Battery. 1991. Washington, D.C.: National Center for Education Statistics. (NCES 91-468).

Ingels, S.J., Scott, L.A., Rock, D.A., Pollack, J.M., Rasinski, K.A. 1993. NELS:88 First Follow-Up Final Technical Report. Chicago: NORC.

example, Hispanics) and certain types of schools (for example, Catholic schools and alternative schools) were sufficiently overrepresented to allow for separate analyses.

The HS&B sample was a two-stage stratified cluster sample. In the first stage, an updated sample frame of public and private high schools in the United States was stratified (that is, grouped and ordered) according to several key variables. These variables, while increasing the precision of the sample estimates by creating relatively homogeneous groups of schools, were also similar to the stratification variables used in NLS-72. The clusters (in this case, schools) were then selected independently within each stratum of schools with probabilities proportional to the size of their enrollment. This permitted oversampling of certain types of schools to ensure a sufficient sample size for independent analyses. Schools that refused to cooperate or that were ineligible for selection were replaced by other schools, so that the overall target sample size could be achieved.

In the second stage of HS&B sampling, NORC selected 36 students from both the sophomore and senior classes of each selected school. Provisions were incorporated that accounted for changes in the student sample frame (for example, transfers in and out of the school between initial sampling and data collection) and for small class sizes (for example, in schools with fewer than 36 sophomores [or seniors], all sophomores [or seniors] in the school were added to the HS&B sample). Weighting adjustments were made to the final sample to account for school and student nonresponse. A detailed description of the sample design, sample selection and sample results may be found in Frankel, Kohnke, Buonanno, and Tourangeau, 1981. An assessment of HS&B base year school nonresponse bias may be found in Tourangeau, McWilliams, Jones, Frankel & O'Brien, 1983.

The NELS:88 Sample Design. The sample design for NELS:88 was similar in essential respects to the designs used in the NLS-72 and HS&B. A principal difference between NELS:88 and the earlier studies series, however, is that in its base year NELS:88 sampled a cohort of eighth graders rather than high school students. In the 1987-88 school year, students were sampled through a two-stage process. First, stratified random sampling and school contacting resulted in a final school sample of 1,052 schools.[3] The second stage of sampling involved selection of about 26 students per school--24 core students and, on average, 2 oversampled Asian and Hispanic students. (Asian-Hispanic oversampling was conducted within each NELS:88 school, with the number of Asian and Hispanic students added per school varying considerably, depending on the within-school representation of these populations). The number of students sampled in each school ranged from 1 to 73. As in the HS&B base year, transfers into the school between sampling and data collection were given a chance of selection into the sample, while transfers out of the schools were deleted from the sample.

As in HS&B, certain kinds of schools were excluded from the NELS:88 sample, such as Bureau of Indian Affairs Schools, special education schools, and schools for dependents of U.S. personnel overseas.[4] Excluded from the student sample were individuals with severe mental handicaps, students whose command of the English language was not sufficient for understanding the survey materials and completing them without assistance in a timed session, and students with physical or emotional problems that would make it unduly difficult for them to participate in a group survey administration session. As in HS&B, approximately 70 percent of initially-targeted base year school selections agreed to participate

[3]Some 1,057 schools participated but owing to loss of data in transit, usable student data were received only from 1,052 schools.

[4]Department of Defense Dependents Schools students overseas were surveyed in HS&B, but were not counted as part of the national probability sample and were not weighted, nor was this group included on the regular HS&B data release.

in the study. Of the 26,432 students selected, 24,599 participated, for an unweighted completion rate of 93.1 percent and a weighted completion rate of 93.4 percent.

In the next wave of the study, 1987-88 eighth graders were followed to their new schools (the vast majority of sample members changed schools between 1988 and 1990), or out of school, if they were dropouts. A subsample of base year sample members (both participants and nonparticipants) was selected from those who were still enrolled in school; dropouts, however, were retained with certainty. A 20 percent subsample was retained of students who transferred out of the final school sample to a new (non-NELS:88) school. Additional sample members were selected from individuals who were 1989-90 sophomores but had no chance of selection into the base year sample either because they were not in the United States or not in the eighth grade at that time. This process of sample "freshening" provided the NELS:88 first follow-up with a nationally representative sample of sophomores, comparable to the HS&B 1980 sophomore cohort. Of the 19,363 students selected for the 1990 round, 18,221 completed a student questionnaire, for an unweighted completion rate of 94.1 percent and a weighted completion rate of 91.1 percent. Of 1,161 identified dropouts, 1,043 completed a dropout questionnaire, for an 89.8 percent unweighted and 91.0 percent weighted completion rate. Some 99 percent of first follow-up schools cooperated with the study. The first follow-up sample was student-driven. Unlike the NELS:88 or HS&B base years, the schools attended by NELS:88 sophomores did not constitute a national probability sample of schools.

(For a detailed description of the NELS:88 base year sample design, sample selection and sample results, please see Spencer, Frankel, Ingels, Rasinski, and Tourangeau, 1990; for details of the first follow-up sample design and its implementation, see Ingels, Scott, Frankel, Lindmark and Myers, 1992.)

Differences of Frame Definition, Eligibility, and Other Factors that May Affect the Comparability of HS&B and NELS:88 Estimates to Other Sources and To Each Other. Several factors may explain why the estimates derived from these two surveys differ slightly from other national estimates; some of these factors may tend also to exaggerate differences in sophomore population coverage (hence also in estimates) between the two surveys and hence reduce the degree of strict trend comparability.

Differences in estimates can be observed across some enrollment variables when different sources are compared.

Total tenth grade enrollment. For the HS&B base year, NCES fall public school enrollment statistics showed 3.6 million sophomores (the NCES estimate of 3.638 million autumn 1979 sophomores, employed by NORC in considering the possible utility of HS&B post-stratification weighting, was later revised downward to 3.527 million, as currently reported--see Digest of Education Statistics 1991, Table 38), while HS&B spring 1980 projections showed 3.4 million. For seniors, NCES fall enrollment for 1979 was given as 3.1 million, with an HS&B spring 1980 estimate of 2.75 million.

For the NELS:88 first follow-up, Current Population Survey October 1989 estimates show 3.2 million students enrolled in the second year of high school while NELS:88 gives a spring term 1990 estimate of 2.8 million. If CPS projected counts are adjusted downward for dropouts between October and spring, and NELS:88 estimates revised upwards to include excluded students and schools, this difference is substantially reduced (3.1 million versus 3 million).

The Common Core of Data shows that sophomore public school enrollment declined substantially (around 19 percent) over the decade, with 3.527 million sophomores in fall of 1979, and 2.867 in fall of 1989 (see Table 38 in Digest of Education Statistics 1991).

Based on comparison of spring term 1980 and spring term 1990, HS&B shows 3.760 million public and private school enrolled sophomores, while NELS:88 first follow-up shows 2.823 million, suggesting around a 25 percent decline in the number of sophomores over the decade. However, when NELS:88 projected counts of sophomores are adjusted upward to reflect school and student exclusions, the comparison to HS&B implies an enrollment decline of around 20 percent, an estimate that is quite close to the CCD estimate.

Because of differences in eligibility rates between HS&B and NELS:88 and other factors that may exaggerate differences between 1980 and 1990 population projections, and because both studies are based on school frames that are less comprehensive that those of CCD, we have drawn enrollment trend comparisons for this report from sources such as CCD rather than contrasting the sum of the weights across HS&B and NELS:88. Issues of comparability across sources are elaborated in the paragraphs that follow.

Potential sources of differences include **sampling error**, **school and student eligibility criteria**, and **different reference points for measuring enrollment** (e.g., fall versus spring). Each of these potential sources of difference may be addressed in greater detail.

Sampling error. The sample design yields a sample that mirrors the population only within sampling error; moreover, nonresponse and other forms of measurement error can introduce further distortions. Estimates of the tenth grade population admit of degrees of precision that account for a proportion of the differences between data sources.

Excluded schools. There are some differences between the school universe frames used in HS&B and NELS:88, and those used by NCES to derive enrollment figures--in particular, HS&B and NELS:88, by design, excluded certain types of schools from the sample. (The Census Bureau's Current Population Survey, because it collects school enrollment status information from households and not from schools, circumvents problems of school frame definition and completeness.) While the impact of school exclusion on estimates is small, it is nonetheless one of a number of factors that must be taken into account when HS&B and NELS:88 data are compared to other statistical sources. Of course, some additional schools are excluded from such a study as well, not by design, but inadvertently, owing to incompleteness of sample frame information. No national listing of schools is completely comprehensive and accurate, and small private schools in particular may form and dissolve at a rapid rate.

Excluded students. Exclusion of certain categories of students also affects overall enrollment and subgroup estimates; this too constitutes a difference between student-based studies such as NAEP, HS&B, and NELS:88, which exclude some students, and other sources that are more inclusive (for example, such household surveys of adults as the Current Population Survey, or administrative records surveys of state education agencies such as the NCES Common Core of Data). Enrollment totals projected to by weighting reflect undercoverage in the frame. Racial/ethnic (and other) proportions are influenced too by the composition of the excluded student group. Groups that are disproportionately represented among the ineligible students (for example, blacks) will appear as a correspondingly lower proportion of the included students, to which the NELS:88 sample weights project. Inaccurate school records also may have the effect in rare instances of excluding students, some of whom may have been left off sampling rosters.

Differences in rates of student ineligibility can produce differences in completeness of coverage between HS&B and NELS:88. Even though essentially the same eligibility criteria were applied in both studies, lower proportions of students tend to be excluded in high school settings than in earlier grades,

and the growing proportion of the school-age population that is limited in its English proficiency affects ineligibility rates as well (for a parallel, see exclusion rates in the National Assessment of Educational Progress by grade and by year, as reported in the various NAEP technical reports). Of course, some students excluded in the base year (for example, for lack of proficiency in English) would have been included in a study drawn from tenth graders, because they could have become proficient in English over the two ensuing years. In the NELS:88 base year, 5.34 percent of the potential sample was classified as ineligible and excluded from the study.[5]

However, in the NELS:88 first follow-up, a subsample of these base year ineligible eighth graders was followed, and many members of this group were reclassified for various reasons (for example, their eligibility status may have changed over time) so that they became eligible for NELS:88 in the first follow-up and were administered a 1990 student questionnaire. At this time, the newly eligible 1988 ineligibles who were surveyed in the 1990 round have not yet been integrated into the first follow-up dataset. After these cases are added, the sophomore population projected to by the weights will increase by several percentage points and the comparability of the HS&B 1980 and NELS:88 1990 datasets will be increased. While the exclusion of the 1990-eligible base year ineligibles from these analyses involves small numbers of students and is unlikely to alter any of the conclusions of this report, more precise estimates of 1980-1990 sophomore cohort differences can be drawn after this population is integrated into the sample in the second follow-up (1992) re-release of the 1990 data.

Fall versus spring enrollment totals. In addition, benchmark sources such as the Current Population Survey and Common Core of Data draw on fall enrollment figures, which tend to be inflated compared to spring enrollment, the focal point for HS&B and NELS:88 estimates. Fall enrollment figures (particularly for public schools) tend to be inflated because some students will drop out in the course of the school year. Spring term counts of students will therefore be lower than fall. (Also, there is often ambiguity about enrollment in the autumn; a student who is expected to enroll but is in fact a summer transfer may be double-counted. Such cases, however, are typically accounted for in the revised estimates states submit to CCD). Finally, to the degree that there are racial or ethnic differences in tenth grade dropout rates, the racial proportions of sophomores will differ somewhat depending on whether an autumn or spring reference point is used.

Other sampling differences that may affect analysis and comparison. Comparisons of public and private schools are complicated by the variety of both public and private schools--a variousness of source of control, organization, practices, and general circumstances.[6] There are some important differences

[5]An overall exclusion rate is not explicitly reported in the HS&B documentation. Hoachlander (1992, NCES 91-667) notes that "according to Harnisch, Lichtenstein, and Langford [Delwyn L. Harnisch, Stephen Lichtenstein, James B. Langford, Digest on Youth in Transition, Champaign, Illinois, 1986], 94 percent of the students who can be positively identified as handicapped in HS&B were physically handicapped; the national rate of physical disabilities among school age children with special needs is 4 percent. Only 6 percent of the students identified as handicapped in the HS&B sample were learning disabled, and none were emotionally disabled or retarded. The vast majority of all handicapped students is generally comprised of these three disability groups, so the sample of handicapped students in HS&B...is in no way representative of the national population of handicapped students." Language barriers constitute an additional basis for exclusion in HS&B and NELS:88. For a systematic discussion of exclusion issues see McGrew, Thurlow, Shriner, & Spiegel, 1992.

[6]Additionally, these diverse kinds of schools have diverse goals, and emphasize to different degrees such aims of education as fostering cognitive achievement, aesthetic appreciation and expression, socioemotional development, the building of character, and religiosity. Neither the HS&B nor the NELS:88 instruments measured all facets of this range of outcomes in depth, although differences in cognitive outcomes, ethos, and schooling processes are more systematically captured.

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in the way that public and private schools were categorized and sampled that place limitations on HS&B and NELS:88 comparisons.

The HS&B school sample was designed to facilitate analysis of the following school types, each of which was subject to further substratification:

Public Schools: (1) Non-alternative non-Hispanic schools; (2) Non-alternative Hispanic schools; (3) Alternative schools;

Non-Catholic Private Schools: (1) Non-elite, non-Catholic; (2) Elite, non-Catholic;

Catholic Schools: (1) Non-black, non-Hispanic Catholic; (2) non-Cuban, Black/Hispanic Catholic; (3) Cuban Catholic.

NELS:88, on the other hand, was designed to provide a substantially larger sample of non-Catholic private schools than did HS&B, and was designed to support analyses of four explicit school control types: public schools, Catholic schools, independent schools (members of the National Association of Independent Schools), and other private schools.[7] A comparison of the HS&B and NELS:88 base year samples shows the different distribution of schools across the three broad school types employed in this report--public, Catholic, and other private:

	HS&B	NELS:88
Public	893	815
Catholic	84	104
Private, Non-Catholic	38	133
Total	1,015	1,052

However, sophomores in NELS:88 were studied two years after the base year, at the schools to which eighth graders had dispersed, within a school sample that was no longer nationally representative--hence school sector differences can be examined only at the student level, not at the school level, when NELS:88 and HS&B are compared. While large numbers of NELS:88 students remained within the private non-Catholic sector, further school control type comparisons with HS&B are difficult to make. In many ways the elite private category in HS&B is comparable to the independent school category in NELS:88, though these strata were somewhat differently defined. In HS&B, elite private schools were defined as the twelve private schools with the highest percentage of graduating seniors who were National Merit Scholarship semifinalists. In NELS:88, the membership list of NAIS was the frame for drawing the independent school sample. About half of the 133 non-Catholic private schools on the NELS:88 base year files were independent schools, but only eleven elite private schools participated in HS&B. Thus, much richer school sector analyses are possible within each study than between the two studies.

[7]The NELS:88 dataset also permits schools to be categorized as public, Catholic, private school--other religious affiliation, and private school--no religious affiliation. Indeed, this is the only school control variable to appear on the public use files, though both school control variables appear on the privileged use files.

Precision of Estimates

The accuracy of reported statistics is determined by the joint effects of sampling and nonsampling errors. Surveys such as HS&B and NELS:88 are also subject to nonsampling errors. Nonsampling error may arise from a number of sources, such as the inability to obtain cooperation from a sample member, or the unwillingness or inability of a respondent to answer a given item asked in a survey. In addition, exclusion of persons who should be included in the universe, variability in providing estimates, differences in interpreting the meaning or intent of questions, errors in data capture, editing or coding may also result in nonsampling error. The quality of HS&B data is assessed in Fetters, Stowe and Owings.[8] Nonsampling errors in NELS:88 are discussed in the base year and first follow-up user's manuals and technical reports. The overall quality of the base year student questionnaire data is assessed in Kaufman, Rasinski, Lee and West.[9] No comparable assessment of the quality of NELS:88 tenth grade data has been undertaken at this date, although more restricted assessments of data quality are reported in the user's manual and final technical report.

Estimates of sampling variability--expressed as the standard error of measurement--appear in Appendix A. Sampling errors occur because the data are collected from a sample of the population rather than the entire population. The standard error is a measure of the variability due to sampling for a particular parameter estimate. It indicates how much variance there is in the population of possible estimates of a parameter for a given sample size of a particular sample design. Standard errors can be used as a measure of the precision expected from a particular sample.

Statistical Procedures

Significance Testing. Comparisons that have been drawn in the text of this paper have been tested for statistical significance to ensure that the differences are larger than those that might be expected due to sampling variation. The statistical comparisons in this report were based on the **t** statistic. Generally, whether the statistical test is considered significant or not is determined by calculating a **t** value for the difference between a pair of means or proportions and comparing this value to published tables of values at certain critical levels, called alpha levels. The alpha level is an a priori statement of the probability that a difference exists in fact rather than by chance.

In order to make proper inferences and interpretations from statistics, a number of issues must be kept in mind. First, comparisons resulting in large **t** statistics may appear to merit special attention. This is somewhat misleading since the size of the **t** statistic depends not only on the observed differences in means or percentage being compared but also on the number of respondents in the categories used for comparison, and on the degree of variability among respondents within categories. A small difference compared across a large number of respondents could result in a large **t** statistic. Second, when multiple statistical comparisons are made on the same data, it becomes increasingly likely that an indication of a population difference will be erroneously given. Even when there is no difference in the population, at an alpha-level of .05 there is still a 5 percent chance of declaring that an observed **t** value representing

[8]Fetters, W.B., Stowe, P.S., and Owings, J.A. 1984. Quality of Responses of High School Students to HS&B Questionnaire Items. Washington, D.C.: National Center for Education Statistics.

[9]Kaufman, P., Rasinski, K.A., Lee, R., and West, J. 1991. Quality of the Responses of Eighth-Grade Students in NELS:88. Washington, D.C.: National Center for Education Statistics (NCES 91-487).

one comparison in the sample is large enough to be statistically significant. As the number of comparisons increases, the risk of making such an error in inference also increases.

To guard against errors of inference based upon multiple comparisons, the Bonferroni procedure[10] to adjust significance tests for multiple contrasts was used. This method corrects the significance (or alpha) level for the total number of contrasts made with a particular classification variable. Because the comparisons of interest were across cohorts, for each column or dependent variable in each table the number of comparisons was the total number of row categories for all of the classification variables in the table. For example, for Table 2.2, General High School Program, the number of comparisons was 19. The Bonferroni procedure divides the alpha-level for a single t-test (for example, .05) by the number of pairwise comparisons to derive a new alpha corrected for the fact that multiple contrasts are being made.

Interested readers can compute the **t** statistic between estimates from various subgroups presented in the tables using the following formula:

$$t = \frac{P_1 - P_2}{\sqrt{(se_1^2 + se_2^2)}}$$

where **P1** and **P2** are the estimates to be compared and **se1** and **se2** are their corresponding standard errors.

For example, suppose one wanted to compute the **t** statistic to compare the difference between 1980 and 1990 sophomores expecting to be in professional occupations at age 30. The estimates are in Table 6.4 in the text (p. 51) and the standard errors of the estimates are in Table 6.4 in Appendix A (p. 16, Appendix A). First subtract one estimate from the other (the order in which this is done determines the sign of the value but has nothing to do with the value's statistical significance). In this case, subtract 40.6 (the percentage of 1980 sophomores aspiring to one of the professions) from 57.4 (the percentage of 1990 sophomores aspiring to one of the professions). This gives 16.8. Next square the corresponding values from Table 6.4 in Appendix A (.51 and .75), add the squared values (1.58), then take the square root of the sum (1.25). To obtain the **t** statistic, divide the difference between the estimates (16.8) by the square root of the sum of the squared standard errors (1.25). The final result is a **t** statistic of 13.4. For information on how to interpret this statistic, especially taking into account the fact that a number of different comparisons are possible for these data, the reader is referred to the materials cited in footnote 9 in this appendix.

Standard errors reported in this document (except for Chapter 3) are Taylor series approximations calculated with the C-Tab program developed by C. Dennis Carroll and available from NCES. Chapter 3 employed a design effect correction for standard errors (see the first follow-up student component user's manual--pp. 56-58--for further information on computing design-corrected standard errors for NELS:88).

Effect Sizes. Sophomore mathematics results for 1980 and 1990, as reported in Chapter 3, were also examined in terms of their effect sizes. The effect size is a measure of change represented in standard deviation units. For the analyses presented in Chapter 3, effect sizes are calculated as the

[10]For detailed discussion, see, for example, Hays, W.L. 1988. Statistics. (4th ed.) New York: Holt, Rinehart, Winston; Myers, J.L. 1979. Fundamentals of Experimental Design. (3rd ed.) Boston: Allyn and Bacon; and Klockars, A.J. and Sax, G. 1986. Multiple Comparisons. Beverly Hills: Sage.

change in average test scores from 1980 (1990 mean minus 1980 mean) divided by the pooled 1980/1990 standard deviation. Thus, the effect sizes measure change in test scores from 1980 to 1990 relative to the score's total variability, calculated as the score's standard deviation pooled across the two years. This is why effect sizes are often described in terms of standard deviation units. For example, an effect size of .25 for male sophomores gain in mathematics achievement is reported in Chapter 3. This can be calculated using values in Appendix A, Table A.3.2.

The effect size is not a test of statistical significance, but a measure of **practical** significance of subgroup differences. While large sample sizes may result in small differences being statistically significant, differences of less than an effect size of ten percent (.10 standard deviation units) are unlikely to be meaningful. To give an example from the Chapter 3 data, Figure 1 compares raw mathematics score means for 1980 and 1990 males and females. When effect sizes are examined, male sophomores gained .25 of a standard deviation unit between 1980 and 1990, while their female counterparts gained .27 of a standard deviation unit (see Appendix A, Table 3.2). The social science literature refers to effect sizes of this magnitude as substantively significant and in the small to medium range of effect sizes (Cohen, 1988). Effect sizes in the range of .10 to .20 that are accompanied by a statistically significant finding are considered to be small and of "borderline" practical significance.

For the purposes of Chapter 3 of this report, if there was a statistically significant interaction between cohort year and the demographic classification variable, for example, between year and gender **and** there was a difference of .10 or greater between their effect sizes, then the resulting interpretation will be that there is some evidence (albeit small) of a differential growth rate in favor of one group or another. For example, if there were a statistically significant interaction between year (1980, 1990) and gender groups (male, female) and males had an effect size associated with their gain of .20 and females had an effect size associated with their gain of .30 then the interpretation would be that females showed a somewhat greater growth rate than male students. (For detailed documentation, see Appendix A, Table 3.1 [R-Squares From Combinations of Predictors] and Table 3.2 [Statistical Test of Group Means Including Effect Sizes].)

Analysis Procedures

The analysis populations compared in this report comprise the HS&B sophomore cohort in 1980, and NELS:88 spring term 1990 sophomores. (Total and subgroup sample sizes [unweighted Ns] are reported in Appendix A, Table 1.)

While the HS&B sophomore cohort was later subsampled by eliminating most base year nonrespondents in 1982 and by dropping further sample members (including some base year respondents) in 1984, cases utilized for analysis in this report embrace the full 1980 sample.

Because of its eighth grade starting point, the NELS:88 combined base year-first follow-up student data files contain several distinct analysis populations. These include:

Population 1: The eighth grade cohort in 1988;

Population 2: A subsample of the 1988 eighth grade cohort in 1990;

Population 3: The sophomore cohort in 1990, comprising all members of population 2 who are enrolled in tenth grade, and a sample of freshened students who were not in eighth

grade in the spring term of 1988 but were in tenth grade in the spring term of 1990.

Population 3 was utilized for trend analyses reported here. (For details on proper use of weights and flags to define analysis populations in NELS:88, see the NELS:88 First Follow-up Student Component Data File User's Manual.)

Trend Comparisons

Although the NELS:88 student questionnaire was designed to maintain comparability to the HS&B baseline instruments, caution must nevertheless be exercised in comparing data for the HS&B and NELS:88 sophomore cohorts. For example, NELS:88 oversampled Asians to obtain ample numbers for analysis; HS&B did not. NELS:88 also oversampled students from non-Catholic private schools at a much higher rate. While, despite such differences, weighting ensures generalizability of the samples to national populations, finer-grained analyses may be constrained where a subgroup within one of the cohorts is represented by a paucity of cases.

Both HS&B and NELS:88 are based on grade cohorts, not age cohorts. However, if there are substantial differences over time in factors such as dropout rates, then the degree to which the in-school population differs from the total population for the relevant age group may differ, leading to different SES, race, or gender compositions for the in-school cohorts over time, quite apart from any wider national changes in sociodemographic distributions. Moreover, factors such as the declining dropout rate of the 1980s may affect other in-school comparisons as well, such as analyses of achievement and attitudinal trends. For example, if a substantial proportion of students who would have been dropouts a decade ago now remain in school, given that such individuals will tend to score lower than the population of sophomores as a whole, 1990 tested achievement will be depressed, and the degree of improvement in the educational system understated.

Student participation rates were substantially lower in HS&B base year than in NELS:88 first follow-up. For the HS&B sophomores in 1980, 84 percent of the sample completed the student questionnaire and 77 percent completed the cognitive tests. (The HS&B response rate includes participating substitutes; under certain circumstances in HS&B--but not in NELS:88--original selections were replaced.)[11] For the NELS:88 sophomores in 1990, 94 percent completed the student questionnaire and 90 percent completed the cognitive tests. Moreover, the characteristics of the nonrespondents may also differ somewhat across the two studies. Again, while nonresponse adjustments in sample weighting partly compensate for such differences, they do so only imperfectly.

At the school level, 70 percent of the initial HS&B selections agreed to participate in the study. In the NELS:88 first follow-up, participation rates approached 99 percent, and students from refusing schools were surveyed outside the school setting. Nevertheless, any school-level sample bias carries over to the NELS:88 first follow-up from the baseline survey in 1988. School participation rates for the

[11]In the HS&B base year, replacement of a student occurred when a selected student died, was discovered to be a listing error (should not have appeared on the roster), when a student dropped out of school or through some extreme situation became unavailable for the entire school year, or when a student was physically or mentally unable to participate in the survey. There was no effort to replace students who refused to participate. In NELS:88, there was no replacement or substitution procedure for any of the above situations. In both HS&B and NELS:88 base years, transfers out of the school were deleted from the sample without being replaced, though students who transferred into the school between survey day and the time the original roster was drawn became eligible for sample selection. For details, see Frankel et al. 1981 and Spencer et al. 1990.

NELS:88 base year were quite similar to those in HS&B, with 70 percent of the initial selections participating, and the remaining 30 percent of the participating school sample made up of substitute schools. For both HS&B and NELS:88, information about nonresponding schools was used to analyze the probable extent of bias in estimates concerning characteristics of the student population. These analyses (see Tourangeau et al. 1983 and Spencer et al. 1990 for details) suggest a relatively low school nonresponse bias to each study's estimates (for example, for NELS:88 base year, only four of the fourteen bias estimates differ significantly from zero).

Item response rates for questions that appear in both surveys differ, although item response in general tends to be quite high except for some HS&B items that appear late in the questionnaire. In addition, while the HS&B and NELS:88 science and math tests are similar to each other, and there are common quantitative comparison items in the cognitive test batteries that facilitate HS&B-NELS:88 equating of the mathematics tests, the social studies and reading tests are quite different and therefore do not provide a suitable basis for intercohort change measurement.

Other differences between the 1980 and 1990 studies--the typically smaller group administration sizes for NELS:88, the fact that most NELS:88 sample members had also been surveyed as eighth graders (hence, the possibility in the NELS:88 case--but not HS&B-- of "panel effects"), differences in context and question order for trend items in the two student questionnaires, and other factors as well, may also influence the accuracy of comparisons between the NELS:88 and HS&B sophomore cohorts.

A detailed discussion of the implications of HS&B-NELS:88 design differences for conducting trend analyses is contained in Appendix D of Ingels et al. 1992, NELS:88 First Follow-Up Student Component Data File User's Manual (NCES 92-030). A useful discussion of parallel intercohort time lag comparison issues drawn from NLS-72 and HS&B appears in Hilton et al. 1992, chapters 9, 10 and 13.

Other Trend Data for HS&B Sophomores: Transcripts Sources. Trends in program placement and course enrollment patterns can also be analyzed using the 1987 NAEP High School Transcripts Study and the 1982 HS&B Secondary Transcripts Study (a probability subsample of the school records of the HS&B sophomore cohort). The NAEP transcripts are a particularly rich comparative source. However, unlike the senior cohort two years before, HS&B sophomore cohort seniors in 1982 did not constitute a nationally representative sample of high school seniors and results for this group are not fully generalizable to the graduating class of 1982 because seniors who were not sophomores two years before are unrepresented. The 1982 transcripts study is effectively a study of 1980 sophomores two years later, when most had completed high school, while the 1987 study examines the school records of 1986 juniors in 1987, after most had completed their secondary schooling. Results of the two studies are therefore roughly rather than precisely comparable. In addition, the 1987 transcripts effort fully represents handicapped students. In HS&B, however, only some handicapped students are included--students with more severe mental and physical impairments were ineligible to take part in HS&B, and, unlike the procedure for the 1987 study, the HS&B transcripts study sought records only for students who had been deemed eligible for the main survey.

Data files for two additional nationally-representative transcripts studies are currently being prepared by NCES contractors--the NAEP 1990 High School Transcripts Study, which collected transcripts in spring of 1991, and the NELS:88 Academic Transcripts Study, data collection for which took place in the autumn of 1992. The sample for the 1990 High School Transcript Study is nationally representative of U.S. schools teaching grade 12 or having 17 year old students, and the sample of students is a representative sample of graduating seniors from each school. In the NELS:88 transcripts study, only the student sample is nationally representative--of 1992 seniors, of 1990 sophomores two

years later and of 1988 eighth graders four years later (including dropouts, early graduates, and students who did not graduate on time).

Variables Used

This section provides definitions for the variables used in tables for each of the chapters.

Classification Variables: The following classification variables were used throughout the chapters to compare subgroups across cohorts.

Students were classified into **gender** groups by using the variable BB083 in the HS&B data and F1SEX in the NELS:88 data. **Socioeconomic status** (SES) was ascertained by recomputing quartiles from BBSESRAW in HS&B and F1SES in NELS:88.[12] In each case, the two middle categories were collapsed yielding a three category variable (lowest quartile, middle two quartiles, and highest quartile).

The socioeconomic status variable (F1SES) in NELS:88 was constructed from parent reports (when available), with substitution of student reports when parent data were missing. The following parent questionnaire variables were utilized: father's educational level, mother's educational level, father's occupation, mother's occupation, and family income. Occupational data were recoded using the Duncan SEI scale as used in NLS-72 and HS&B (for details, see the first follow-up student component user's manual, appendix I, pp.5-6). When parent data were missing, student reports of parental occupation and education were employed and household items data were used instead of the family income variable.

The socioeconomic status variable in HS&B (BBSESRAW or BYSES) was constructed using procedures highly similar (but not identical) to those employed in NELS:88. The principal differences are as follows. In HS&B, student data were used instead of parent data, mother's occupation was not included in the HS&B index, NELS:88 employed family income or the household items index while HS&B used both, and for most NELS:88 first follow-up sample members (that is, base year participants), SES is based on 1988 questionnaire responses not 1990 responses (for HS&B sophomores SES was constructed from 1980 responses).

School control type (public, Catholic, and other private sector) was ascertained by using the HS&B variable SCHLTYPE; a NELS:88 school sector composite was modified to provide comparability. More specifically, the G10CTRL2 variable from the NELS:88 privileged use file (this variable does not appear on the public use data base) was recoded. In its original form, this variable contains four school sector categories: 01=public school; 02=Catholic school; 03=independent (NAIS) private school; 04=all other private schools. School control categories 03 and 04 were combined to create a three-category school sector variable comparable to HS&B.

The tenth grade school **region** variables are CENRGN for HS&B and G10REGON for NELS:88. In 1980 and 1990, the four regions contain the following nine Census divisions:

Northeast: New England and Middle Atlantic

[12] The HS&B base year SES quartile variable, BBSES, was computed (as in NLS-72) from the assumption of a normal distribution, rather than from the data. Hence for the HS&B first follow-up release, base year SES quartiles were recalculated to provide four categories with equal (weighted) frequencies. NELS:88 F1SES, on the other hand, was standardized on a different sample from the sophomore cohort analyzed here--it included members of the eighth-grade cohort who had dropped out or who were not in tenth grade in the spring term of 1990.

North Central (Midwest): East North Central and West North Central

South: South Atlantic, East South Central, West South Central

West: Mountain and Pacific

States are distributed across the four regions as follows:

Northeast: Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania

North Central (Midwest): Ohio, Indiana, Illinois, Michigan, Wisconsin, Iowa, Minnesota, Missouri, North Dakota, South Dakota, Nebraska, Kansas

South: Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, Texas

West: Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, California, Alaska, Hawaii

Note: the new Census naming convention for the North Central region is "Midwest".

The **race/ethnicity** variable for NELS:88 was F1RACE. For HS&B a race/ethnicity variable was created from BB089 and BB090 from the base year and RACE from the HS&B first follow-up. Respondents were assigned a race value using responses to BB089 unless their responses to BB090 indicated they were Hispanic. If that was the case, responses to BB090 were used. Missing responses were filled in to the extent possible by using information from the first follow-up RACE variable.

For NELS:88 the composite **test quartile** variable was ascertained from F1TESTQ. For HS&B a base year test quartile variable was created by using the same procedure used to create the NELS:88 variable. Nonmissing responses to standardized test scores for reading, vocabulary, and math (YBREADSD YBVOCBSD YBMTH1SD) were averaged and quartiles were created based on weighted responses to this summary variable. Composite test quartile is a plausible general ability measure, but because of differences between the 1980 and 1990 tests, should not be used to measure changes in achievement between the two time points.

The following additional variables were used in specific chapters.

CHAPTER 1: THE CHANGING CONTEXT: AMERICAN EDUCATION AND SOCIETY, 1980-1990

Chapter 1 employed only standard classification variables, as described above.

CHAPTER 2: SCHOOL EXPERIENCES

High school program was determined by examining responses to BB002 in HS&B and F1S20 in NELS:88. Categories for F1S20 were recoded to match those in BB002. (However, NELS:88 offered a Don't Know category, which was utilized by around 7 percent of the 1990 total sample; HS&B

provided no Don't Know option.) High school transcripts are generally recognized to provide a more objective and reliable indicator of program placement, enrollment patterns, and grades than student self-reports. Transcripts also provide a basis for identifying students who have met the requirements for more than one program type. (In both HS&B and NELS:88, students who indicated more than one program were assigned the nonresponse code "6" [or "96"].) At the time of the writing of this report, only student self-reports were available for 1990 sophomores. Transcripts data will be available in the fall of 1993.

The motivational variable **level of preparation**[13] (coming to school without writing implements, books, and homework) was assessed by examining responses to YB016A,B,C in HS&B and F1S40A,B,C in NELS. Categories in HS&B were (in order, 1 to 4) USUALLY, FAIRLY OFTEN, SELDOM, and NEVER. NELS:88 categories were NEVER, SELDOM, OFTEN, and USUALLY. NELS:88 items were reverse-scored to match HS&B items. **Feeling safe in school** was measured by BB059 in HS&B and F1S7M in NELS. In HS&B the categories were TRUE/FALSE, while NELS:88 used four categories (STRONGLY AGREE, AGREE, DISAGREE, STRONGLY DISAGREE). The AGREE and DISAGREE categories were collapsed in the NELS:88 item. Important differences in the perception of safety may exist at different grade levels within the same sample of schools. (In the HS&B base year, only 8 percent of seniors felt unsafe at school, compared to 12 percent of sophomores.)

CHAPTER 3: MATHEMATICS ACHIEVEMENT

HS&B and NELS:88 Mathematics Tests: HS&B. The HS&B sophomore cohort mathematics test administered in 1980 (and repeated in 1982) comprised 38 items, with 21 minutes allowed for completion. The items consisted of quantitative comparisons in which the student indicates which of two quantities is greater, or asserts their equality or the lack of sufficient data to determine which quantity is greater.

NELS:88. The NELS:88 first follow-up mathematics test contained 40 items, to be completed in 30 minutes. The NELS:88 mathematics battery assessed both simple mathematical application skills and more advanced skills of comprehension and problem solving. As in HS&B, only multiple choice tests were administered. However, test items included word problems, graphs, quantitative comparisons (as in NLS-72 and HS&B), and geometric figures. Three versions of the mathematics test were developed for the first follow-up, varying in the level of difficulty. Assignment to a first follow-up mathematics test form was based on the respondent's base year math test results.

HS&B-NELS:88 Test Equating. In order to compare mathematics performance of the 1980 HS&B sophomore cohort with that of the 1990 NELS:88 sophomores, the two sets of mathematics scores

[13]It may be of interest to take note of the relationship of these motivational measures to key educational outcomes; this may be done with reference to recent analyses of NELS:88 data. P. Kaufman and D. Bradby report (Characteristics of At-Risk Students in NELS:88, NCES 92-042, p. 32) that compared to students who always brought the necessary materials and homework to class, students who usually came without pencil or paper or without their homework were more than two and a half times more likely to perform below the basic mathematics proficiency level, and approximately two and a third times more likely to perform below the basic reading level. Kaufman and Bradby observe that "students who usually come to class without books were four times more likely to perform below the basic math level, and three and one-half times more likely to perform below the basic reading level than students who never came without their books. Students who usually came to class without these sets of materials (pencil and paper, books, or homework) were about four times more likely to drop out of school [between eighth and tenth grade] than students who never came without these materials." While these indirect measures of motivation seem powerful when used to pick up the low end (that is, lack of engagement) of the motivational continuum, it is unfortunate that other (and broader) measures of engagement used in the two studies were not sufficiently comparable to support trend analyses.

had to be put on the same scale. The NELS:88 mathematics test was originally designed to be linked to the HS&B scores. This was accomplished by including 16 quantitative comparison items from HS&B in the NELS:88 mathematics test. Mathematics was the only cognitive test in the NELS:88 battery that shared sufficient items with its counterpart measure in HS&B to enable a reliable cross-walk between the two scales.

The linking was carried out by estimating the item response theory (IRT) parameters for the common items using the NELS:88 sophomore sample and then putting the remaining non-overlapping HS&B items on that scale. Before the final linking was carried out the item traces for the common items were estimated separately for the two populations and compared to insure that they were "behaving" similarly in the two populations. A final check on the validity of the equating was carried out by inspecting subpopulation differences among the HS&B students after they were put on the same scale as the NELS:88 cohort. If the linking worked as desired, then the relative differences that were found among the HS&B subpopulations on their original scales should not change when they are put on the new scaling. All subpopulation differences remained relatively invariant indicating that the linking was successful. Further details of HS&B-NELS:88 test equating procedures can be found in the NELS:88 First Follow-Up Final Technical Report.

CHAPTER 4: AFTER-SCHOOL ACTIVITIES

Participation in school activities was measured in considerably different ways in both surveys. Participation items for HS&B were drawn from the series beginning with BB032B and ending with BB032N. Participation items for NELS:88 were drawn from F1S41AA to F1S41AI and F1S41BA to F1S41BI. The following table lists the items in each survey used to construct each activity item.

Athletic Teams	BB032A	F1S41AA-AG
Cheereading	BB032B	F1S41AH,AI
Music	BB032D,E	F1S41BA
Academic Clubs	BB032G	F1S41BG
Hobby Clubs	BB032F	F1S41BH
Vocational Clubs	BB032H	F1S41BI

In the HS&B survey respondents could only indicate whether they participated actively or did not participate in the activity. In NELS, respondents were given a much wider range of choices, including participating on a freshman team, an intramural or a varsity team, and participating as a team captain. All of these responses were collapsed into one indicator of participation for the activity. In addition NELS:88 allowed respondents to indicate whether a school did not have one of the activities. Because HS&B did not allow such a designation, these responses were counted as nonparticipation.

Television viewing was assessed by examining BB048 in HS&B and F1S45A in NELS. Comparison of HS&B 1980 and NELS:88 1990 data suggests that television watching declined at the high end, that is, for those watching 5 or more hours per week. Trend data from NAEP are not strictly comparable since sophomores are not assessed in NAEP and the NAEP and HS&B television viewing items are very different, but NAEP data do not support the notion of a general trend toward decreased television viewing. The NAEP item and trend data are given below:

How much television do you usually watch each day?

None...

1 hour or less...
2 hours
3 hours
4 hours
5 hours
6 hours or more

NAEP trend results are taken from Table 6.7 in Mullis et al., Trends in Academic Progress, 1991:

	0-2 hours	3-5 hours	6 or more hours
Age 13			
1990	31	53	17
1982	45	39	16*
Age 17			
1990	51	41	9
1978	69	26	5

(*Not statistically significant at .05; all other contrasts are significant.)

The HS&B question--BB048-- was asked of both the sophomore and senior cohorts in 1980 and was worded as follows:

During week days about how many hours per day do you watch TV?

Don't watch TV during week.....
Less than 1 hour.....
1 hour or more, less than 2....
2 hours or more, less than 2...
3 hours or more, less than 4...
4 hours or more, less than 5...
5 or more.....

It is possible that some respondents misinterpreted this question, and supposed that it asked them to report the number of hours they spend viewing television on a weekly, rather than a daily basis. If so, reports at the high end of viewing in particular may be inflated. Response frequencies for this item were as follows:

	Soph. BB048	**Senior** in 1980
0	2.5	3.6
0-<1	6.4	11.6
1-<2	13.0	18.2
2-<3	19.2	21.3
3-<4	18.1	18.0
4-<5	13.0	11.1
5,5+	27.8	16.3

However, this item was re-asked of sophomore cohort members two years later, in a modified form that admitted of less ambiguity:

1980:
During week days about how many hours per day do you watch TV?

Don't watch TV during week.....

1982:
During weekdays about how many hours per day do you watch TV?

Don't watch TV during weekdays...

If we assume that national television watching behaviors would have changed little over a 24-month period, and if we assume that sophomores and seniors randomly selected from the very same schools are essentially similar, we might compare the 1980 senior results, using the original question wording, with the 1982 results, using the revised wording. If our hypothesis that some students in 1980 over-reported by giving data on a per week rather than per day basis is correct, then we might expect a comparison of twelfth grade results for 1980 and 1982 to reflect this, with higher reports of TV viewing for 1980 seniors, reflected in higher utilization of the high-end categories. This comparison appears below and lends at least some support to such an hypothesis:

	1980 BB048	**1982** FY61
0	3.6	6.0
0-<1	11.6	15.2
1-<2	18.2	21.6
2-<3	21.3	20.2
3-<4	18.0	14.7
4-<5	11.1	9.2
5,5+	16.3	13.0

The form of the television viewing item developed in the NELS:88 base year (and retained in the NELS:88 first follow-up with the addition of the phrase "or videotapes") constitutes, we think, a very strong measure of TV viewing. Note, however, that the upper response category on the NELS:88 item is labelled "over 5 hours a day" while the upper HS&B response option is "5 or more". The NELS:88 item (1990 variable F1S45) appears below:

During the school year, how many hours a day do USUALLY watch TV or videotapes? ANSWER BOTH A AND B BELOW.

	On Weekdays	On Weekends
Don't watch TV..		
Less than 1 hour a day		
1-2 hours...		
2-3 hours...		
3-4 hours...		
4-5 hours...		
Over 5 hours a day		

Since there are large quantitative differences between weekday and weekend viewing (as is confirmed by the NELS:88 base year and first follow-up responses to this question), it seems most appropriate to ask about weekdays, or separately, about both weekdays and weekends, rather than asking respondents to provide an estimate for an entire week. Otherwise, the amount of cognitive processing demanded of respondents admits of too much error or variability. To derive a total for the week, one must separately process weekday and weekend viewing and mathematically derive a third estimate for the week as a whole. It also seems appropriate to tie such an item to the school year, since summer and school holiday viewing patterns may differ from media usage when school is in session. Finally, the addition of videotape viewing ties a post-HS&B media use to the question--a use which may have displaced some traditional TV viewing but is functionally, for purposes of this question, equivalent to it. It should also be noticed that the highest category in the response scale for the HS&B item is 5 or more hours.

We recommend that caution be exercised in interpreting the 1980 - 1990 television viewing data. While the HS&B and NELS:88 sophomore comparisons clearly show a downward trend in high levels of weekday television watching, the base year HS&B item may have been flawed in its construction, and other sources do not corroborate such a trend. A much truer test of television viewing trends will be offered by the NELS:88 1992 data, given that the 1982 HS&B question was less ambiguous and presumably a truer measure.

Participation in out-of-school activities (visiting with friends, reading for pleasure, driving around, talking with friends on the telephone) was assessed by using items BB047A, B, D, and E in HS&B and items F1S44A,D,I, and J in NELS.

CHAPTER 5: SELF-PERCEPTIONS, SOCIAL IMAGE, AND VALUES

The **Locus of Control** items were BB058B BB058E BB058F BB058K in HS&B and F1S62C F1S62F F1S62G F1S62K in NELS. The **Self-Esteem** items were BB058A BB058C BB058H BB058J BB058L in HS&B and F1S62A F1S62D F1S62H F1S62J F1S62L in NELS:88. The response categories for the NELS:88 items were reverse coded to match those used in HS&B. In HS&B a NO OPINION category was present. Respondents selecting this category were assigned a missing value.

The **Social Image** items were YB053A YB053B YB053C YB053D YB053E YB053F YB053G for HS&B and F1S67A F1S67B F1S67C F1S67D F1S67E F1S67F F1S67G for NELS. NELS:88 response categories were reverse coded to match the HS&B coding. **Life values** were measured by BB057A BB057B BB057C BB057D BB057E BB057G BB057H BB057I BB057J BB057K BB057L in HS&B and F1S46A F1S46B F1S46C F1S46D F1S46E F1S46G F1S46H F1S46I F1S46J F1S46K F1S46L in NELS:88.

CHAPTER 6: PLANS AND EXPECTATIONS

Plans for timing of college entry were determined from responses to BB115 in HS&B and F1S51 in NELS. The NELS:88 item was recoded to conform to the coding used in HS&B. **College**

expectations were determined from HS&B item BB065 and NELS:88 item F1S49. The HS&B item was a reasonably good predictor of who in fact went on to college.[14] Kinds of **career advice** received by the respondent were measured by responses to items BB050A,B,C and D in HS&B and F1S47A,B,E and F in NELS:88. For each of the four sources of advice (father, mother, counselor, teacher) the response "go to college" was coded "1" and other advice was coded "0". "Does not apply" responses were coded as missing. Occupational expectations were assessed from BB062 in HS&B and F1S53 in NELS:88.

[14]In their analysis of HS&B data, Pelavin and Kane (1990) report that "more than 85 percent of the students who indicated that they expected to continue their education at least through a bachelor's degree attended college within four years of high school graduation" while "only 40 percent of students who did not declare their intention to complete a college degree during the sophomore year went to college within four years of high school". Questionnaire and transcript data from the 1992 HS&B fourth follow-up will help to provide a better picture of how many of these individuals who went on to college have actually completed their college programs and been awarded degrees.

APPENDIX C: HS&B and NELS:88 -- An Overview

The longitudinal studies program of the U.S. Department of Education's National Center for Education Statistics (NCES) reflects the agency's commitment to collect and analyze data on the factors affecting the transitions of students from elementary school to high school and eventually to productive roles in American society. Consistent with its commitment--and in response to the need for policy-relevant, time-series data on nationally representative samples of elementary and secondary students--NCES instituted the National Education Longitudinal Studies (NELS) program, a continuing long-term project. The general aim of the NELS program is to study the educational, vocational, and personal development of students at various grade levels, and the personal, familial, social, institutional, and cultural factors that may affect that development. The NELS program currently consists of three major studies: the National Longitudinal Study of the High School Class of 1972 (NLS-72); High School and Beyond (HS&B); and the National Education Longitudinal Study of 1988 (NELS:88). Taken together, these studies represent the educational experience of youth from three decades-- the 1970s, 1980s, and 1990s. The research design for these three studies is depicted in Figure C.1, below.

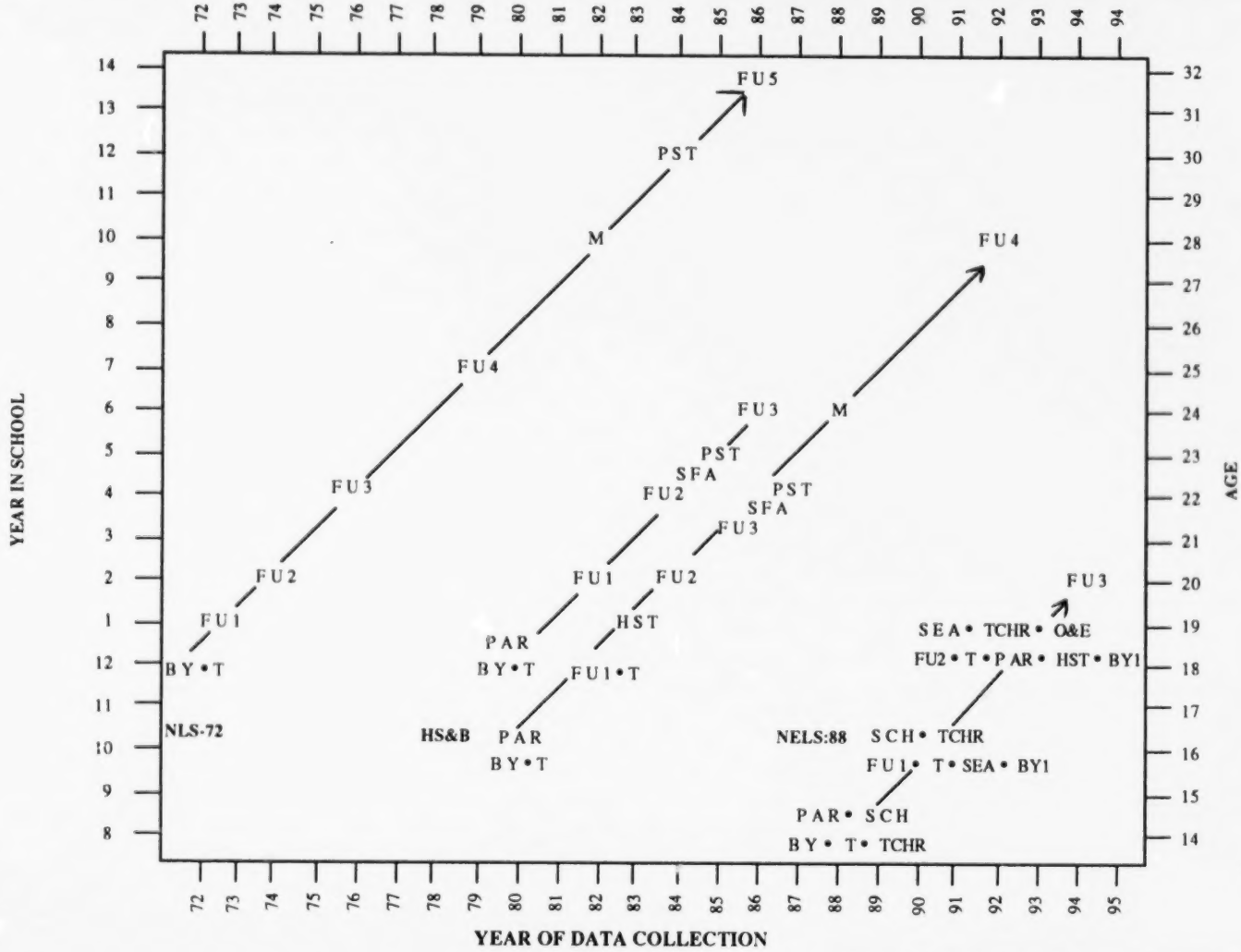
High School and Beyond. This report analyzes data from two of the three studies, HS&B and NELS:88. HS&B was designed to build on the NLS-72 in three ways. First, the introduction of a sophomore cohort provided data on the many critical educational and vocational choices made between the sophomore and senior years in high school, permitting a fuller understanding of the secondary school experience and its impact on students, as well as providing a basis for comparing dropouts and school persisters. Second, the base year survey of HS&B included a 1980 cohort of high school seniors that was directly comparable with the 1972 cohort. Replication of selected 1972 student questionnaire items and test items made it possible to analyze changes that occurred subsequent to 1972 and their relationship to recent Federal policies and programs in education. (Some of these changes are analyzed and reported in Fetters, Brown & Owings, 1984, who compare 1972 NLS-72 seniors with HS&B 1980--senior cohort--seniors).[1] Finally, HS&B expanded the NLS-72 focus by collecting data on a range of lifecycle factors, such as family-formation behavior, intellectual development, and social participation.

The HS&B Base Year Survey. This report utilizes data collected in the HS&B base year from the sophomore cohort. The base year survey was conducted in the spring term of 1980. The study design provided for a highly stratified national probability sample of 1,015 secondary schools as the first stage units of selection. In the second stage, 36 seniors and 36 sophomores were selected in each school (in schools with fewer than 36 students in either of these groups, all eligible students were included). Certain types of schools were oversampled to increase the usefulness of HS&B data for policy analysis. These included public schools with high percentages of Hispanic students, Catholic schools with high percentages of minority students, alternative public high schools, and private schools with high-achieving students.

The HS&B base year student questionnaires focused on individual and family background, high school experiences, work experiences, and plans for the future. The cognitive tests measured verbal and quantitative abilities, and included achievement measures in science, writing, and civics. School questionnaires provided information about enrollment, staff, educational programs, facilities and services,

[1]Rock, Ekstrom, Goertz, Hilton and Pollack (1985) also report intercohort comparisons based on the 1972 and 1980 (HS&B senior cohort) seniors, while Ekstrom, Goertz and Rock (1988) invoke a ten year perspective to compare NLS-72 seniors in 1972 with HS&B 1982 (1980 sophomore cohort) seniors.

Figure C-1: Research design for the NCES National Education Longitudinal Studies program



NLS-72 = National Longitudinal Study of the High School Class of 1972
BY = Base year data collection
FU1 = First follow-up data collection
FU2 = Second follow-up data collection
FU3 = Third follow-up data collection
FU4 = Fourth follow-up data collection
FU5 = Fifth follow-up data collection
M = Maintenance of address date
PST = Postsecondary education transcripts
T = Cognitive test administration

HS&B = High School & Beyond: 1980
BY = Base year data collection
FU1 = First follow-up data collection
FU2 = Second follow-up data collection
FU3 = Third follow-up data collection
FU4 = Fourth follow-up data collection
HST = High school transcripts
M = Maintenance of address date
PAR = Survey of parents
PST = Postsecondary education transcripts
SFA = Student financial aid records
T = Cognitive test administration

NELS:88 = National Education Longitudinal Study of 1988
BY = Base year data collection
BY1 = Base Year Ineligible Study
FU1 = First follow-up data collection
FU2 = Second follow-up data collection
FU3 = Third follow-up data collection
HST = High school transcripts
O&E = Course offerings and enrollment data
PAR = Survey of parents
SCH = School administrator survey
SEA = School Effects Augmentation
T = Cognitive test administration
TCHR = Survey of teachers

and special programs. A teacher comment checklist provided teacher observations on students, while the parent questionnaire (administered to a subsample of parents) elicited information about how family attitudes and financial planning affected postsecondary educational goals.

The HS&B Follow-Ups. A subsample of the 1980 HS&B senior cohort was followed out of school, and resurveyed in 1982, 1984, and 1986. The sophomore cohort was resurveyed in 1982, when most sample members were high school seniors, although a substantial proportion of the cohort was surveyed out of school, either as dropouts (14%)[2] or early graduates (5%). The sophomore cohort was again resurveyed in 1984, 1986, and in 1992. Postsecondary transcripts information has also been collected for both cohorts, with the most recent update of sophomore cohort postsecondary transcripts data taking place in the fall of 1992.

In addition to the various follow-ups of the HS&B student sample, there have been two follow-ups of the HS&B school sample. The Administrator and Teacher Survey (ATS) was conducted in 1984 in a probability subsample of 479 participating HS&B schools. In order to better describe the impact of the school environment on the educational process, ATS gathered information on school climate, process, and functioning from principals; heads of guidance; vocational and community service program coordinators; and up to thirty teachers in each school. The Longitudinal Study of Schools (LSS) is an OERI-sponsored follow-up of the HS&B 1980-82 schools (the sample was freshened to make it representative of American high schools in 1992). In 1992 data were collected from high school principals about the organization of their school and changes in the school that had occurred since 1982. In addition, detailed information about mathematics instruction and assessment was collected from a sample of mathematics teachers.

NELS:88. NELS:88 differs from both NLS-72 and HS&B in that the first data collection phase began in the eighth grade rather than high school. The base year of NELS:88 represents the first stage of a major longitudinal effort designed to provide data about critical transitions experienced by students as they leave elementary school and progress through high school and into postsecondary institutions or the work force. The 1988 eighth grade cohort is being followed at two-year intervals in order to obtain policy-relevant data about educational processes and outcomes--particularly those pertaining to student learning, early and late predictors of dropping out, and school effects on students' access to programs and equal opportunity to learn.

NELS:88's major features include the integration of student, dropout, parent, teacher, and school administrator and school records studies; initial concentration on an eighth grade cohort with follow-ups at two year intervals; inclusion of supplementary components to support analyses of geographically or demographically distinct subgroups; and design linkages to previous longitudinal studies and other current studies. Private schools, and both Hispanic and Asian students, were oversampled in NELS:88 to ensure sufficient numbers of language minority and private school students for separate analyses. Multiple research and policy objectives are addressed through the NELS:88 design. The study is intended to produce a general purpose dataset for the development and evaluation of educational policy at all government levels. NELS:88 focuses on a number of interrelated policy issues, including:

[2]While 13.6 percent of the sophomore cohort was surveyed as dropouts in 1982, some sample members surveyed as students dropped out after survey day or otherwise left school before graduating. Thus, based on transcripts data and information from the follow-up surveys, the HS&B 1980-82 dropout rate was in fact 17.3 percent. (By the time of the HS&B third follow-up in 1986, almost half (46.5%) of the HS&B dropouts had completed high school or received a GED.)

students' academic growth over time, and the family, community, school, and classroom factors that promote or inhibit student learning;

the transition of different types of students from eighth grade to secondary school (and later, from secondary school to postsecondary education or the labor force);

the influence of ability grouping and differential course-taking opportunities on future educational experiences and outcomes;

determinants and consequences of dropping out of (and of returning to) the educational system;

changes in educational practices over time;

the role of the school in helping the disadvantaged and the school experiences and academic performance of language minority students;

NELS:88 Base Year. The base year survey was conducted in the spring term of the 1987-1988 school year. A clustered, stratified national probability sample of 1,052 public and private eighth grade schools participated. Almost 25,000 students across the United States participated in the base year study. The sample represents the Nation's eighth grade population, totalling over 3 million eighth graders in more than 38,000 schools in spring 1988. Questionnaires and cognitive tests were administered to each student in the NELS:88. The student questionnaire covered school experiences, activities, attitudes, plans, selected background characteristics, and language proficiency. The school principal completed a questionnaire about the school; two teachers of each student were asked to answer questions about the student, about themselves, and about their school; and one parent of each student was surveyed regarding family characteristics and student activities.

The **first follow-up**, which took place in **1990,** provides the first opportunity for longitudinal measurement of the 1988 baseline sample. It also provides a comparison point to high school sophomores ten years before, as studied in HS&B. The study captures the population of early dropouts (those who leave school prior to the end of tenth grade), while monitoring the transition of the student population into secondary schooling. The first follow-up survey was primarily conducted in the spring term of the 1989-90 school year. As in the base year, students were asked to complete a questionnaire and cognitive test. The cognitive test was designed to measure tenth grade achievement and cognitive growth between 1988 and 1990 in the subject areas of mathematics, science, reading, and social studies (history/geography/civics).

The first follow-up of NELS:88 comprised the same components as the base year study, with the exception of the parent survey, and a freshened sample was added to the student component to achieve a representative sample of the nation's sophomores. Some 18,221 students participated (of 19,363 selected), with 1,043 dropouts taking part (of 1,161 identified), for a total of 19,264 participating students and dropouts. In addition, 1,291 principals took part in the study, as did nearly 10,000 teachers.

The NELS:88 first follow-up sample was designed to support several different levels of analysis. One such level is longitudinal analysis, in which changes from the 1988 baseline are measured two years later, in the spring term of 1990. A second level of analysis is cross-sectional. Because the longitudinal sample has been "freshened" with 1990 sophomores who were <u>not</u> in eighth grade in the United States in the 1987-88 school year, it is a representative sample of the nation's spring term 1990 sophomores.

Finally, by maintaining a degree of comparability in questionnaire and test measures employed, NELS:88 first follow-up results will support comparisons with HS&B sophomores of 1980.

The **second follow-up** took place early in **1992**, when most sample members were second term seniors. The second follow-up provides a culminating measurement of learning in the course of secondary school. In addition, the NELS:88 second follow-up resurveyed students who were identified as dropouts in 1990, and identified and surveyed those additional students who had left school since the prior wave. The NELS:88 second follow-up questionnaires and cognitive tests were designed to meet four general requirements for information about American education. These can be characterized as **looking backward** within the cohort to understand the impact of prior experiences (particularly at eighth grade and tenth grade) on current circumstances; **looking ahead** to provide a basis for understanding cohort members' future experiences (for example, the transition to the labor market or postsecondary education, to be studied in the third and fourth follow-ups); **looking within** the cohort at a single point in time to compare the outcomes and experiences of different social groups; and **looking across** cohorts by comparing the experiences of the NELS:88 1992 senior cohort to those of seniors studied in 1980 in HS&B and in 1972 in NLS-72, and by comparing the experiences of HS&B and NELS:88 dropouts.[3] Second follow-up data will be released early in 1993.

The NELS:88 **third follow-up** will take place in **1994**, when most sample members will have left high school. The primary goals of the 1994 round will be to provide for trend comparisons with NLS-72 and HS&B, and to address issues of employment and postsecondary access and choice. Additionally, the third follow-up will provide a basis for assessing how many dropouts have returned to school and by what route, and for measuring the access of dropouts to vocational training programs and to other educational opportunities. A **fourth follow-up** is scheduled for **1997**.

[3]Because the NELS:88 longitudinal sample was freshened to represent the twelfth grade class of 1992, trend comparisons can be made to the senior cohorts of 1972 and 1980 that were studied in NLS-72 and HS&B. (In addition, although the HS&B 1980 sophomore cohort was not freshened in 1982 so that it would constitute a fully representative sample of the nation's seniors, the HS&B and NELS:88 sophomore cohorts can be compared on a "two years later" [1982-1992] basis by excluding the 1992 freshened seniors from the analysis.) Because the NELS:88 sample was freshened in 1990 to fully represent the nation's sophomores, comparisons can also be made to the HS&B sample of sophomores who dropped out of high school between spring term 1980 and spring term 1982.

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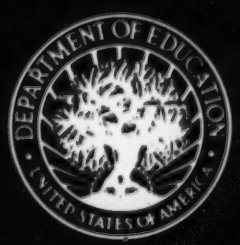
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